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ABSTRACT

Reprints of 20 articles pertaining to the topics of end-users and public access appear in this volume, which is one in a series of volumes of reprints from "ONLINE" and "DATABASE" magazines. Edited for information professionals who use electronically distributed databases, these articles address such topics as: (1) managing a compact disc read-only memory (CD-ROM) installation; (2) organizing an extensive laserdisk installation; (3) DIALTWIG; (4) simulating an online search; (5) end-user searching in a large library network; (6) using INFOTRAC in university libraries; (7) using computer graphics to train end-users; (8) ERIC on CD-ROM; (9) SearchMaster for the end-user; and (10) eliminating fees for online searching services in a university library. The articles and columns appearing in this volume have been selected from "ONLINE" and "DATABASE" issues from 1985 through early 1988, with the majority in the 1986-1987 period. (CGD)

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END-USERS/ PUBLIC ACCESS

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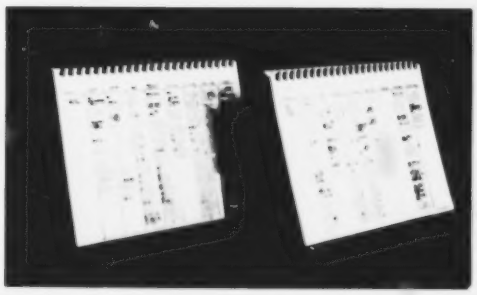

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END-USERS & PUBLIC ACCESS

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END-USERS & PUBLIC ACCESS

PREFACE

This volume is part of a six volume series of reprints from ONLINE and DATABASE magazines. Both are edited for information professionals who use databases distributed electronically. Most readers do their searching through central databanks, such as DIALOG. Most of the coverage in ONLINE and DATABASE reflects this fact. However, a certain amount of coverage is also devoted to other media, such as laserdisks. (full coverage of laserdisks is in a companion journal, The Laserdisk Professional.)

The following articles and columns have been selected from ONLINE and DATABASE issues from 1985 through early 1988, with the majority in the 1986-87 period.

Other titles in the Best of ONLINE and DATABASE series include:

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MANAGING A CDROM INSTALLATION. . . A CASE STUDY AT HAHNEMANN UNIVERSITY

by Howard Silver
Reference Librarian
Hahnemann University

INTRODUCTION

"Greatest time saver since the washing machine. . ."

This is one user's opinion of SilverPlatter's **PsycLIT** CDROM database installed in the Hahnemann University library. CDROM-based information retrieval systems are a new species in the information kingdom. Laserdisks and database software provide faster and more flexible access to stored information than a printed index or reference book. Additionally, a well designed user interface allows people to search these databases effectively with minimal training. Libraries can purchase CDROM databases at a fixed cost, whereas the costs of online end-user databanks or gateways are based on volume of use. This makes it possible for libraries to provide users with unlimited access to databases without the problems and costs of online communications. These characteristics of CDROM give it the potential to change the way libraries provide information, and the way users access it.

Hahnemann University library introduced CDROM to its users in May 1986, when we acquired Compact Cambridge **MEDLINE** on a trial basis. [1] Since then, the library has purchased subscriptions to Compact Cambridge MEDLINE and SilverPlatter's PsycLIT. Additionally, the library has become a beta test site for **Permuterm Subject Index (PSI)** portion of the **Science Citation Index**, and has received the Micromedex **Computerized Clinical Information System** for evaluation. This article describes how the staff manages the changes brought about by the CDROM databases, and how our user community has responded.

HARDWARE AND SOFTWARE

The library has four CDROM workstations available to the public. Each station consists of an IBM PC XT with a ten or 20 megabyte hard disk, a Phillips CM100 CDROM drive and a Phillips CM155 CDROM controller card, a Hewlett-Packard Quietjet Plus printer, and a surge protector. One workstation, on casters, can be easily moved around the library for demonstrations and classes. Each CDROM station is dedicated to a single database. As the library acquires more databases, either the least used databases will share workstations, or additional stations will be installed. The PsycLIT and MEDLINE stations will remain as single database workstations because of the heavy demand for these databases.

The CDROM stations are located near the in- ►

CDROM workstations—*The CDROM stations are located near the hardcopy indexes and within sight of the reference desk. They are close to the circulation/reserve desk.*

dexes within sight of the reference desk and close to the circulation/reserve desk (Figure 1). Unused CDs and spare inkjet cartridges are stored in a locking floppy disk file box behind the circulation/reserve desk.

Patrons have access to the CDROMs during all the library's open hours and reference assistance is available at all times. Compact disks are not handled by library users. They are changed by circulation and reference staff on request.

TRAINING LIBRARY STAFF

Fifteen librarians, three circulation staff, and ten student assistants have CDROM responsibilities. Six librarians and the student assistants are part-time employees, working evening and weekend hours. Four of the librarians do online searching on a regular basis, and the level of computer literacy of the staff varies considerably. Table 1 outlines the basic skills that staff members need to learn in order to successfully assist CDROM users. Student assistants are limited to providing hardware support. Librarians and circulation staff provide hardware support, training and assistance to CDROM users.

The library has instituted a training program to teach CDROM skills to library personnel. Full-time staff have participated in a hardware skills seminar. In addition, reference and circulation staff attend one hour seminars for each database. The seminars are followed by one-to-one review sessions which review the basic skills and current procedures. Procedures are continually updated to reflect changes in software and database coverage. Procedural changes are documented and posted on a clipboard at the reference desk.

CHANGES IN WORKLOAD

The introduction of CDROM databases has increased the volume of reference questions. The number of reference queries between January and March 1987 was 20 percent higher than during the same period of 1986. CDROM queries represented 31 percent of all reference queries in the first quarter of 1987. Online search requests increased by four percent.

CDROM questions fall into two general categories: reference questions and new user training. Reference questions can usually be answered quickly without disrupting other activity. New user training, however, has the potential to interfere with reference desk responsibilities. Many patrons get started on new CDROM databases with five to ten minutes of assistance, but others require much more guidance. A training protocol was developed to balance the demands of CDROM instruction with other reference activity (Table 2). The aim of the protocol is to quickly provide basic knowledge for the user to get started, and to provide follow up instruction at a later point.

Experienced CDROM users require far less assistance than new users. It is expected that the proportion of experienced users to new users will become increasingly balanced towards experienced users. Also, as staff become more experienced with CDROM databases, they are able to dispose of queries more quickly. Although training can interfere with traditional reference activity, an important and unexpected benefit of this new technology is that new avenues of communication have been opened with the user community. The CDROM databases act like magnets. They attract people who would normally not frequent the library, and bring librarians in con-

The CDROM databases act like magnets. They attract people who would not normally frequent the library. . .[and] the library places minimal restrictions on CDROM use.

tact with regular users who do not normally require assistance. This presents an opportunity to promote library services, receive user feedback, and to improve the overall bibliographic skills of the user community.

ACCESS AND PROMOTION

The library places minimal restrictions on CDROM use. Users are free from time limits and print restrictions, and are permitted to browse freely and extensively. Thus far, our greatest fears regarding unrestricted access, excessive printing, machine monopolization, and lack of total security have not been realized. The majority of our users exercise the selective printing capabilities of SilverPlatter and Compact Cambridge. Although we encourage downloading both to reduce the time spent searching, and to save on our material costs, few users have shown interest in this option.

New CDROM databases and other significant changes are announced with large, strategically placed posters, newsletter articles, and contacts with significant faculty and staff. Following initial promotion, word-of-mouth becomes a powerful promotional tool.

BIBLIOGRAPHIC INSTRUCTION

Since January 1987 the library has offered CDROM classes as part of its bibliographic instruction program. The library held 22 one hour classes between January and March, 1987, reaching a total of 237 people. Classes focus on a single database and are taught using our mobile workstation connected to a projection system. Originally the display unit was connected to a video monitor, but the library now uses a Sharp QA-25 computer projection panel.

The aims of the bibliographic instruction program are to promote CDROM usage, increase user effectiveness, and reduce the load of new user instruction on reference and circulation staff. In addition, this format enables staff to discuss software capabilities and database structure in much more detail than in a five to 15 minute one-to-one session. Classes are offered as lunchtime seminars aimed at hospital and university personnel. Student instruction is arranged with faculty during scheduled classes.

PUBLIC RESPONSE

Between January and March 1987, a questionnaire was distributed to CDROM users. One hundred completed forms were returned and the results were summarized on a percentage basis in Table 3. The overall response to the CDROM databases was highly positive. Of our respondents, 88 percent found the systems easy to learn, and 95 percent found them easy to use. Furthermore, 91 percent of respondents retrieved relevant citations, and 89 percent did so within what they felt was a reasonable period of time. This is consistent with Sharon Dennis' original survey of Compact Cambridge MEDLINE users when it was first introduced at Hahnemann. [2] In that survey 88 percent of MEDLINE users found the system easy to learn, and 86 percent found it easy to use.

While 86 percent of our responding group claimed experience with a personal computer, only 23 percent had used a computer previously for information retrieval. Students comprised 74 percent of the respondents. Faculty, residents, staff and others made up the remaining 26 percent. Only four percent of our respondents were able to learn the systems without reference to documentation or third party assistance. Seventy-four percent of new users were assisted by a librarian, 47 percent used printed documentation, 41 percent used help screens, and 29 percent were assisted by friends or colleagues. Ninety-five percent of those who received assistance from a librarian found it useful, while 80 percent of those who used help screens, and 78 percent of the users of printed documentation found them useful.

The survey results were examined, comparing the responses of staff and students; users with computer experience versus inexperienced users; and users with computer information retrieval experience versus inexperienced users. The results of these comparisons are summarized in Table 4.

There were few notable differences in the response patterns of the above groups. Of these, the greatest differences were observed between users with PC experience and those without computer experience. One hundred percent of the inexperienced users required a librarian's assistance vs. only 70 percent of the experienced group. Experienced users were more likely to find relevant citations (95 percent vs 64 percent) and were better able to complete their searches within a reasonable time frame (91 percent vs 79 percent). Users experienced in computer information retrieval were more likely to use printed documentation than those without (61 percent vs 43 percent). However, this group was also less satisfied with the response time of the CDROM databases (78 percent vs. 92 percent).

Most users were satisfied with the display and print capabilities of our equipment. Nine criticized printer speed or print quality. Two did not like the PsycLIT display (color monitor). Eleven requested either more machines or more years of information on CDROM.

There are some factors which could lend a positive bias towards this data. The foremost

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is that users who received a librarian's assistance would be more likely to fill out a questionnaire. The assistance provided by librarians also contributed to the ease of searching, successful results, and timely completion of searches reported by the majority of users. Despite this bias, we believe that the attitudes and experience of the survey respondents accurately reflect the experience of the Hahnemann user community.

DISCUSSION

The introduction of CDROM databases to Hahnemann University Library has had a number of positive effects. Library users have substantially improved access to current scientific and medical literature. Positive word-of-mouth advertising has brought a number of users into the library who would be less likely to use the library under other circumstances. The need for CDROM training has opened new avenues of communication between library staff and the user community. Finally, we have exposed a large portion of our user community to automated information retrieval for the first time.

. . .we have exposed a large portion of our user community to automated information retrieval for the first time.

User response to CDROM databases has been highly positive. The comments section of our survey elicited numerous superlative opinions of the systems such as excellent, wonderful, amazing, terrific or great (28 respondents). Libraries that have offered InfoTrac, the laserdisk product from Information Access Company, report similar enthusiastic responses from their patrons. [3] Discussions with our users and comments from the survey indicate that they compare the CDROM products with the printed indexes they are accustomed to using.

Although CDROMs are popular, they have not saved the library time or money. We maintain subscriptions to the paper counterparts of the CDROM databases, and have purchased workstations to run the databases. Funds for the workstations came from an existing grant for automating library functions. The CDROM subscriptions were purchased out of the journal budget. It was possible to add the CDROM subscriptions as well as other serial subscriptions because of an increase in the journal budget and cancellation of little-used journal titles. The cancellations were part of an ongoing review process and not related to the purchase of the CDROMs. We expect the ongoing cost of the CDROMs to be included in the journal budget and that the library operating budget will cover the costs of equipment maintenance and supplies.

The introduction of CDROMs has increased the library's workload in several areas. Reference activity has increased. The library has invested considerable time in staff training. Bibliographic instruction has been expanded to include CDROM databases. Procedures have been documented, and CDROM hardware and software require ongoing maintenance. Online searching has not decreased.

Reference statistics and the user survey indicate that new users require the assistance of an experienced intermediary. Training CDROM users is time consuming, and if responsibility for both user education and assistance is concentrated in the hands of one or a few individuals, these people could become overburdened. In addition, if only a small proportion of library personnel provide support to CDROM users, a bottleneck in access to expertise is likely to develop, increasing the possibility that the resource will be under utilized and poorly used. Support can best be provided in an environment where many staff can provide some assistance.

Librarians have expressed concern over the inappropriate use of optical-based information retrieval systems. [4] Hall et al. has observed that InfoTrac users search for information about topics beyond InfoTrac's coverage; that they frequently searched poorly; and that they tended not to request assistance from librarians. Similar behavior has been observed among CDROM users at Hahnemann Library, and inappropriate use of resources is certainly not limited to CDROM databases. The library has made reference staff highly accessible to CDROM users and instituted an expanding bibliographic instruction program in order to minimize inappropriate use of CDROMs.

CONCLUSION

With the proliferation of CDROM databases and online catalogs, it seems probable that automated information retrieval will soon become commonplace in libraries. Connolly provides an overview of the breadth of potential CDROM applications for libraries in the near future. [5] The introduction of automated information retrieval will require that librarians invest a considerable amount of time and energy to support the user community. At Hahnemann Library, the introduction of CDROM databases has required an alteration of the library's floor plan and a redefinition of the responsibilities of staff in the public services

department. The additional effort and expense incurred with the introduction of CDROM databases is more than counterbalanced by the highly positive response of our institution's administration, faculty, staff, and students.

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[5] Connolly, Bruce, "Looking Backward—CDROM and the Academic Library of the Future." *ONLINE*, 10, May, 1987, pp. 56-61.

TABLE 1

BASIC KNOWLEDGE REQUIRED TO ASSIST NEW CDROM USERS

A. Hardware Skills (reference and circulation staff, and student assistants)
   1. How to change compact disks
   2. Location of on/off switches on all equipment
   3. How to add paper and clear jammed printers
   4. How to change inkjet cartridges
   5. How to *warm boot* machine
   6. Knowledge of computer keyboard.

B. Software Skills (reference and circulation staff)
   1. How to enter and exit program
   2. Basic search strategy and use of logical operators
   3. Field specific searching
   4. How to display and print
   5. How to download
   6. Procedure for training new users
   7. Interpretation of error messages and simple troubleshooting.

TABLE 2

PROTOCOL FOR ASSISTING NEW USERS

1. Briefly describe database, its coverage and printed counterpart. Ask if user is familiar with printed product.
2. Ask if user is familiar with IBM PC keyboard. If not, point out important keyboard features: return key, shift, backspace erase, cursor pad, space bar, function keys, tab key, escape key, asterisk, backslash key, and '#' key.
3. Point out manual, thesauri, and other user aids.
4. Explain important features on screen display: input area, command bars, where messages appear.
5. Explain logical operators. Stick with 'and' and 'or' unless other logical operators are relevant to the search in question.
6. Show user how to combine search statements. Outline basic approach to search strategy.
7. Wish user good luck and encourage follow-up questions.

TABLE 3

HAHNEMANN LIBRARY CDROM QUESTIONNAIRE

Data is based on 100 respondents. The numbers represent the percentage of respondents.

1. Which of our CDROM databases are you evaluating?

   51 MEDLINE 38 PsycLIT 11 Science Citation Index

2. Have you ever used a computer to search for information?

   23 Yes 76 No prior experience

3. Have you used a personal computer before?

   86 Yes 14 No

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TABLE 3 (continued)

4. Was the system easy to learn? 88 Yes 9 No
5. Was the system easy to use once you had learned to use it?
   95 Yes 3 No
6. What kind of assistance did you use to learn the system? (Check more than one if appropriate)
   43 Help Screen 47 Manual 74 Librarian 29 Friend 4 None
7. If you received assistance, was it useful?

Help Screen	80	Yes	20	No	–	No Opinion
Manual	78	Yes	15	No	6	No Opinion
Librarian	95	Yes	3	No	3	No Opinion

8. Did you retrieve relevant citations? 91 Yes 4 No
9. Was the search completed within a reasonable amount of time?
   89 Yes 10 No
10. What is your status?
    12 Faculty 6 Resident 7 Staff 71 Student 4 Other
11. What are your opinions of the display and print capabilities of the system?

Other Comments (use back page if needed):

TABLE 4

Comparison of questionnaire results contrasting users with computer experience (exp) vs. those without experience (nxp); users with automated information retrieval experience (ret) vs. those without experience (nrt); faculty and staff (fac) vs. students (stu). Number in each cell represents the percent response; n = number of respondents.

Question	exp n=86	nxp n=14	ret n=23	nrt n=76	fac n=25	stu n=71
Experience with Computers	–	–	–	–	78	88
Experience with Automated Information Retrieval	76	0	–	–	22	23
Easy to Learn	87	93	87	88	100	87
Easy to Use	94	100	91	96	96	95
Received Assistance from Librarian	70	100	65	74	74	73
Received Assistance from Manual	47	50	61	43	39	51
Received Assistance from Help Screens	38	57	39	42	39	43
Retrieved Relevant Citations	95	64	91	90	87	93
Retrieved Citations within a Reasonable Period of Time	91	79	78	92	83	92
Faculty or Staff	–	–	26	23	–	–
Student	–	–	74	74	–	–

Communications to the author should be addressed to Howard Silver, Reference Librarian, Hahnemann University Library MS449, Broad & Vine, Philadelphia, PA 19102; 215/448-4573.

HOW TO ORGANIZE AN EXTENSIVE LASERDISK INSTALLATION: THE TEXAS A&M EXPERIENCE

by Kathy M. Jackson, Associate Professor,
Evelyn M. King, Associate Professor,
and
Jean Kellough, Instructor,
Sterling C. Evans Library, Texas A&M University

INTRODUCTION

The appearance of traditional databases on 12-inch video disks, followed by the more predominant CDROM database products, challenged the Sterling C. Evans Library at Texas A&M University in its commitment to "utilize any new information technology which can provide a better service product for users."

This commitment is well-grounded in the library's automated information retrieval service which has been providing mediated online fee-based searches since the early 1970s. In recent years "no charge" searches have been provided for graduate students in their Masters thesis and Ph.D. dissertation research, and some library subsidization is also available for searches in selected research areas. A popular end-user search service, utilizing BRS/After Dark and Knowledge Index, is partially subsidized by the library. Funding for these services has been from the library's acquisitions and access services budget.

The acquisition and implementation of a large laserdisk service in the Evans Library will be the focus of a two-part aricle in *ONLINE* of which this is the first part. Coverage will include: securing the funding, donor recognition, planning the ten-station laserdisk service and integrating it into other information services, staffing and staff training, user training, statistics, publicity, outreach, maintenance, lessons learned and future plans.

SECURING THE FUNDING

For several years, the Evans Library has worked closely in its fund raising activities with the University Development Foundation. The library has established a Library Development Council consisting of alumni, former faculty and other interested individuals, which, together with the library's Promotion and Development Coordinator and the University Development Foundation's Library Liaison, plan and develop all facets of the Evans Library's fund raising programs. "Excellence Dinners" held in key cities throughout the state have proven to be effective events for creating more awareness of the library and its needs for special funding.

It was shortly after one of these dinners that the director of the University Development Foundation became aware that a former student and his wife were interested in making a gift which would enable the library to offer a technologically advanced service to benefit students with their course assignments and research efforts. Library staff prepared three proposals which were presented to the potential donors. In preparation for their visit, the library invited Information Access Company to set up a demonstration InfoTrac station. Of the three proposals, the laserdisk search service was the one ultimately selected.

DONOR RECOGNITION

Even as the Reference Division was ordering the equipment and the databases and planning for the integration of the laserdisk service into other reference and information services in the library, plans were underway for ceremonies and other recognition which would honor the donors. For continuous recognition, a sign des-

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ignating the laserdisk search area as the "James and Virginia Wiley Laserdisk Service" hangs from the ceiling over the area, and all search stations have appropriately-worded brass gift plates.

Vicki Anders, Head, Automated Information Retrieval Service, Evans Library, Texas A&M University, presents a demonstration of the Datext CDROM database, at the ceremony honoring James and Virginia Wiley for providing initial funding for the library's laserdisk search service.

At a special ceremony in the fall of 1986, the official announcement of the gift of the new service was made. Speakers on this occasion included the Chairman of the Board of Regents, the Associate Provost of the University, the Library Director and several other Library faculty. At another University-sponsored donor recognition ceremony during the fall of 1986, the Wileys were among more than twenty donors who were recognized for gifts to the Evans Library ranging in amounts from $5,000 to $250,000 or more. Donors' names, recognizing four levels of giving, are inscribed on the base of a special legacy of Learning Donor Recognition Sculpture, which was commissioned by the Library Development Council.

While the donors appreciated the special recognition ceremonies and other publicity about their gift, the recognition they seem to appreciate most is the everyday use of the Wiley Laserdisk Service. Each time the donors have visited the Library, they have talked with students who are doing their assignments with the aid of the laserdisk databases, and the response of the students in using the service has been most gratifying to them—so much so, that they have made available another $100,000 to be used for additional equipment and laserdisk databases, as well as for the renewal of current database subscriptions for an additional year.

PROCUREMENT AND INSTALLATION OF THE LASERDISK EQUIPMENT

The plans for the implementation of the Wiley Laserdisk Service allowed a little under six months for equipment procurement and installation. As things turned out, this was barely enough time. Even though the equipment was being purchased with nonstate funds, state purchasing procedures were followed to ensure that the best possible prices were obtained. Equipment specifications were written, explained to the University Purchasing Agents who were unfamiliar with laserdisk equipment, and bids let and evaluated.

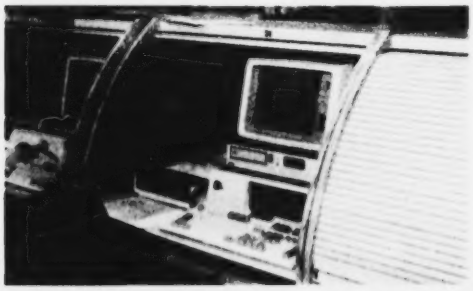
When planning an entirely new service, one has to expect some hitches, and we encountered our share; most were overcome, but some caused us to doubt the possibility of the service being fully operational by the date of the donor recognition ceremony. We worried most about the microcomputers being late, but they arrived before the workstations, and for awhile, the Reference Division's normally crowded offices were inundated with computer system components sitting on every available horizontal surface, including the floor. Even the visitors' chairs were occupied by printers, disk drives, or monitors.

The biggest setback was the unavailability of the science databases from DEC and the difficulties encountered in returning four expensive CDROM drives which were ordered through a DEC wholesale supplier. The CDROM drives had been received but not paid for, when word suddenly came from DEC that the databases would no longer be published. The players were received in August 1986, and permission to return them was not received for several months. This, of course, tied up money which could not be spent on additional equipment until the encumbrance was removed from the account.

When deciding upon the microcomputers for the Wiley service, the staff much preferred IBM equipment like that already in use for office automation and online searching. Because several of the laserdisk database producers would not guarantee that their databases would work on IBM PC ATs, we bought half IBM PC ATs, which we knew would be faster, and half IBM PC XTs, which were being recommended by most database publishers with whom we were negotiating at the time the equipment was ordered in June of 1986. While the computers were obtained on state contract from IBM, the laserdisk drives were obtained a variety of ways: some were obtained from laserdisk database publishers; some were obtained directly from the laserdisk drive manufacturer; and then several were obtained as part of the special arrangements for testing new databases for laserdisk database publishers. On the average, the players cost between $700 and $800 each. We did not elect to purchase service contracts on the laserdisk drives because we generally do not obtain serv-

ice contracts on equipment. This has proven to be a satisfactory decision, because in the first year of operation, there have been no problems with either the Hitachi or the Philips CDROM players.

Because the laserdisk searching stations would be in a public area and exposed at times when there would be few staff in the Library, roll-top microcomputer workstations, which could be locked when the service was not available, were purchased. Not many free-standing securable computer workstations large enough to accommodate a microcomputer, printer and laserdisk player were on the market at the time. The one that best fit our needs was manufactured by ACME Visible Media and was ordered at the same time as the other equipment in early June, 1986.



Each workstation in the Wiley Laserdisk Service includes a microcomputer, a printer, and a laserdisk drive, housed in a computer cabinet with a lockable rolltop.

The microcomputer workstations (furniture) were the last items to arrive the first week in November, after most of the databases and computers had been received. This seemed ironic because delivery of all of the high technology items had been relatively swift, and there we were, anxiously waiting the arrival of ordinary furniture before the whole laserdisk service could be made operational.

Initially, ten microcomputer workstations, each including a microcomputer, printer, laserdisk drive and computer cabinet, were obtained at an average cost of $5,100 each. Other equipment purchased included the InfoTrac multiplexer, controller and controller cards for five microcomputers, plus cabling, for a total cost of $7,350.

An additional expense in the Reference Division was $2,000 for electrical wiring, including $1,100 for the current stations – with three outlets per workstation – and $900 for wiring for future search stations. Five additional search stations have since been purchased utilizing special funds provided by the University, bringing the total to ten hard disk microcomputers equipped with CDROM drives and five microcomputers with dual floppy disk drives for use with the InfoTrac 12-inch videodisk system.

Setting up this much equipment and installing the databases kept the Reference staff busy for several weeks, particularly since everything did not arrive in the sequence needed. Our key staff were already accustomed to inserting computer boards and so forth, so there was not much difficulty with this. The largest equipment challenge faced by most of the staff was learning to deal with a hard disk machine.

SELECTION AND ORDERING OF DATABASES

As Karen A. Becker stated recently in the July/August *C&RL News*, "Choosing CDROM products for a reference department is a complex process."[1] Our major concerns in ordering our first databases were:

1. The database should be one for which there would be high demand. Because of our large end-user online searching program in which over 9,000 searches are conducted per year, and our fairly large mediated searching program involving over 3,500 searches per year, we had a good idea which databases would be in demand.
2. The cost of the database should be reasonable and affordable.
3. When the same database is available both as an online file and as a laserdisk database, some economy should be realized in obtaining the laserdisk database.
4. The searching software should be user-friendly and relatively easy to teach to users.
5. When possible, at least a prototype of the database should have been viewed and evaluated by staff, or else reviews of the database by other librarians who tested it should have been studied.
6. Backfiles should be purchasable at a one-time cost rather than on a lease basis.

The databases selected and purchased for the initial service are listed below. The price given by each CDROM title was taken from the October 1987 issue of *CD-ROM Review*, or was obtained from the publisher, and is not necessarily the cost paid by the Evans Library – in some cases we paid more than the current cost because the prices went down after our initial subscription, and in several cases, because we were early subscribers, we paid less.[2]

Agricola current	$ 1,750
Agricola backfile	$ 1,000

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Books in Print PLUS	$ 895
Dissertation Abstracts current	$ 995
Datext CD/Corporate	$11,720
Electronic Encyclopedia	$ 299
ERIC current (SilverPlatter)	$ 650
ERIC backfile (SilverPlatter)	$ 900
GPI (Government Publications Index from IAC)	$ 2,000
InfoTrac current	$ 8,500
InfoTrac backfile	$ 2,950
LePac: Government Documents	$ 2,500
PsycLIT current	$ 3,150
PsycLIT backfile	$ 1,345

CAN YOU AFFORD TO BE AN EARLY SUBSCRIBER?

Our library was one of the first subscribers for some databases. In several cases, we paid more than the subscription rate when the prices settled down approximately six months after our service started. When there was a great price difference, as in the case of the **ERIC** subscription for which we paid much more than the current subscription price, the publisher moved the renewal date forward a number of months so that we did receive some measure of consideration.

If a library has little money to spend on new technology, then it is probably wisest to wait six months to a year after a new product is introduced before subscribing, so that the price will have had time to stabilize. There are other advantages to be gained, such as having the opportunity to review the product in advance of purchase and also avoiding unfinished products which either don't work, or for which new software releases require frequent revision of handouts for the public. Also, documentation is likely to be more complete. In at least one case, the product arrived several months before the manual, and our staff had difficulty figuring out how it worked. If, however, all libraries hold back, with no one venturing to be an early buyer, then all the risk is placed upon the laserdisk publisher, and we may find very useful products withdrawn quickly because the producer deems them market failures. Fortunately, we have had the support of both the university and library administration in our efforts to gain early experience with new technology. We have been allowed to take risks on new products, and most of our experiences with new products have been worth the risks in terms of what we have learned, and how they benefit users.

WHY WE PURCHASED SPECIFIC DATABASES

Agricola

Agricola was purchased because of the large agriculture interest at Texas A&M. Agricola is the database used most frequently for both mediated and end-user searches. The Agricola backfile was not received until October 1987, although it was ordered in the spring of 1987.

Books in Print PLUS

Books in Print PLUS was very desirable to our technical services staff, as well as to the reference librarians, because at the present time our ALIS II online catalog provides only author and title access to Evans Library holdings. With Books in Print PLUS, students are provided both subject and keyword approaches, and once an item is located, ALIS II can be used to determine whether it is in the library. When the Evans Library's proposed NOTIS system is operational in about a year, Books in Print PLUS may prove to be less popular with the public.

Dissertation Abstracts

Had we relied upon the demonstration disk for Dissertation Abstracts, we would not have obtained this title because the demonstration disk had bugs and often didn't work; yet, we felt that this title would be important to graduate students working theses or dissertations, who are encouraged by their graduate committees to search Dissertation Abstracts before their research proposals are completed.

Datext

This was the most expensive database purchased and a good deal of thought went into its purchase. It was purchased at the urging of the Reference Division's business librarian, but it was not purchased until it had been tested and received strong support from the College of Business. Datext and a number of other companies will place databases in a library for a test period of a month or so, and this trial period can be a real boon for evaluating these products and building support for their purchase. Also, shortly before Datext was ordered, a good review of it appeared in the literature, and Datext was discussed with one of the authors of that review.[3]

Electronic Encyclopedia

This inexpensive tool was purchased mainly to give our staff and students some experience with full-text files. It has received some use by patrons, but more from librarians trying to get a handle on the topic of a particular reference question.

ERIC from SilverPlatter

At the time ERIC was ordered, SilverPlatter

was the only supplier offering it. Our library, however, would probably have chosen the SilverPlatter product anyway because of good experiences with BRS/After Dark and because so many library users already knew BRS search protocols. Even though the commands used to search the laserdisk files are slightly different, it is very easy for someone who has conducted a BRS/After Dark search to then use the laserdisk database. ERIC has been the third most frequently searched online database for graduate students, and overall the fifth most frequently searched.

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GPI (Government Publications Index) and LePac: Government Documents

Readers will probably wonder why we chose to obtain two government documents databases. The reference librarians thought it advantageous to have the GPI file from Information Access Company as part of the InfoTrac system. Our desire is to publicize government documents more heavily, and GPI, which provides subject access, draws users who might not otherwise go to the Government Documents Division for assistance. U.S. documents are not currently in the Evans Library's public catalog, so this is one way to provide access to the public in the general reference area. The Government Documents staff thought it important to have a database which provides keyword, author, and title access in addition to the general LC subject heading-type access provided by GPI; therefore, they selected LePac: Government Documents.

InfoTrac

InfoTrac, as stated previously, was the first laserdisk database system demonstrated for the Evans Library. It was so popular with undergraduates during the demonstration period that it was retained. There are four InfoTrac stations for patrons along with one at the reference desk for staff use.

PsycLIT

This was one of the last databases ordered because of its cost. The Head of Reference held out on this title believing that it was too expensive when compared with many of the other CDROM bibliographic products, for example, Agricola. It is, of course, more expensive because it is not government supported and is produced by an organization which relies upon royalties to underwrite the cost of the abstracting service. What prompted us to subscribe, in addition to general demand from patrons, was a review of the previous year's online searching statistics. Over 750 end-user searches were conducted on PsycLIT. Given that the Library subsidizes the end-user searching program, paying $2.50 of each $5.00 in online time, the Library already was spending $1,875 per year subsidizing psychology searches conducted by end-users. Add to that the Library's cost for the searches for graduate students conducted by librarians during the day at regular rates, and the Library could easily recoup the cost of the PsycLIT subscription. The online file has consistently ranked in the top seven databases in number of searches conducted by librarians and end-users.

NEW DATABASES PURCHASED FOR SECOND PHASE

With the second $100,000 received from the Wileys, an additional six databases and six microcomputer workstations were scheduled to be ordered by November, 1987. The databases proposed for purchase with the Wiley funding include:

Database	Cost
Books Out of Print PLUS	$ 395
Humanities Index	$1,295
LegalTrac	$3,000
Life Sciences Database	$3,150
Newsbank Electronic Index (includes search station)	$3,580
Sociofile	$1,950

These databases were all selected because of heavy potential use, based upon previous usage of the corresponding online database or printed tool at the Evans Library. For example, **Sociological Abstracts** generally ranks in the 15 most frequently searched online files.

In addition, with funding received from the College of Engineering, the **NTIS** and the **Applied Science and Technology Index** CDROM databases are being purchased, along with some equipment. Special university funding was used to order CDROM versions of the **Census of Agriculture**, **Kirk-Othmer Encyclopedia of Chemical Technology**, and the **Dissertation Abstracts backfile**. When the databases listed above are received, there will be a total of eighteen CDROM databases and three 12-inch video disk databases at seventeen CDROM search stations and five InfoTrac stations. ►

SELECTION OF LOCATIONS FOR LASERDISK SEARCH STATIONS

The primary consideration in determining where particular laserdisk databases were to be placed was the desire to locate them in the area where patrons would logically expect to find similar printed tools and nearest the collections for which they provide access; thus, ERIC is in the Microtext Department which houses the ERIC collection, and Newsbank will also be in Microtext, which is the primary location of backfiles of newspapers. LePac: Government Documents was placed in the Government Documents Division which has no full card catalog for its collection; likewise, NTIS, which was recently ordered, will also be placed in the Documents Division because NTIS fiche are a part of the documents collection.

There was not uniform acceptance of this philosophy, as some of the reference staff thought that access to NTIS, as well as to ERIC, would be extremely useful at the Reference desk. Eventually, when the cost for second copies becomes low enough or when utilization of a local area network (LAN) becomes feasible, we should be able to access those databases located in other divisions. The remaining laserdisk databases are in the Reference Division, which is on the first floor; the Documents Division and the Microtext Department are located on the second floor.

Eventually, when the cost for second copies becomes low enough or when utilization of a local area network (LAN) becomes feasible, we should be able to access those databases located in other divisions.

INTEGRATION OF LASERDISK SERVICE WITH ONLINE SERVICES

The formulation of plans for the integration of laserdisk databases with other online services offered by the Reference, Documents, and Microtext units involved the Library Director, the Assistant Director for Collection Interpretation, and the appropriate unit heads. While mediated and end-user searching were services offered only within the Reference Division, both the Documents Division and Microtext Department regularly utilized online search stations located at their service desks to conduct ready-reference searches to answer reference questions. Thus, the staffs of the three units already were familiar with online searching on the DIALOG and BRS systems. The Documents and Microtext staff, however, were faced with a new challenge—teaching users to conduct their own searches.

ERIC AND LEPAC: GOVERNMENT DOCUMENTS

The Documents Division and the Microtext Department adopted similar approaches to the introduction of these new services, both in regards to location and servicing of search stations. In the Documents Division, the current station and the one being purchased for NTIS are located directly across from the reference desk. The two terminals in Microtext, along with the third which comes with the Newsbank subscription, are also located reasonably close to the desk where staff can easily see what patrons are doing and provide assistance as needed.

After the Reference Division received such positive feedback from patrons regarding InfoTrac, which was the first operational laserdisk service, it was no surprise that both ERIC and LePac: Government Documents would be equally as popular. While it was initially assumed that the databases would supplement paper indexes, they have quickly replaced paper usage. Patrons are allowed to use the databases on a "first come, first served" basis. On occasion, we see groups of patrons waiting to use a database; therefore we have had to limit the amount of search time per patron. Documents patrons are limited to five minutes; Microtext patrons are limited to 30 minutes if another user is waiting. Both departments have noticed an increase in the number of "ready-reference" type searches on the CDROM databases; similar searches on the online equivalents have declined.

Both databases feature "powerhouse" searching capabilities, but most patrons are not sophisticated searchers, and limit searches to simple requests—subject, author, and title. Some will try their hand at using Boolean connectors, but don't go beyond an easy combination of terms. We have noticed a type of patron "buddy system": for example, a patron who has used ERIC tends to share his/her knowledge with a classmate who is unfamiliar with the system. The same staff persons who are assigned to the desk also assist patrons with the CDROM databases. Staff have noticed that users are more inclined to try to use the laserdisk databases than they are to use unfamiliar paper indexes on their own. As the number of search stations and terminals increases in these two units, it remains to be seen whether the desk staff can handle the increased

demands for assistance from CDROM databases users.

INTEGRATION OF LASERDISK SERVICES IN REFERENCE

The Wiley Laserdisk Service is located in the same area as the Automated Information Retrieval Service (AIRS), which is comprised of terminals used for both mediated and end-user searching. Both are located just outside the Reference Division offices, but some 200 feet from the reference desk. The photograph below is an overview of the area and the diagram on page 58 shows where each database is located.

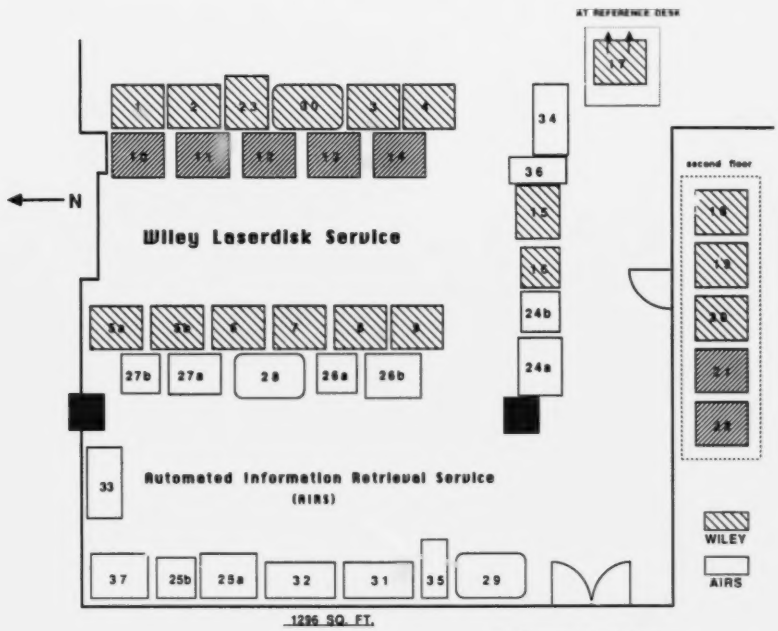
The Wiley Laserdisk Service is conveniently located on the first floor of the Evans Library next to the Reference Offices. The work stations for the laserdisk databases in the Documents Division and the Microtext Department are located on the second floor.

From the findings of a pilot project conducted at the Evans Library, we knew that staff would be opposed to the placement of the laserdisk service directly adjacent to the reference desk. When this was attempted with the end-user searching service and the same staff was used to handle both, the reference librarians and staff became extremely frustrated because their time was so broken up that they could not adequately serve either clientele.[4]

In order to utilize the expertise of the Reference staff already involved in computerized literature searching, the laserdisk program was assigned to the Head of AIRS as an additional responsibility. She was asked to merge the two operations as fully as possible. As a result, the same regular staff, plus some student workers, help with both online end-user searching and with the laserdisk databases. In very busy times, such as evenings when three end-user terminals are usually booked solid for online searching, there are two people staffing the area. As in the Documents and Microtext units, laserdisk databases are available on a first come, first served basis; however, if a queue develops, users are limited to 30 minutes. In the future, a computerized reference scheduling program will be modified so that it not only schedules staff to work at the reference desk, but also in the laserdisk area. Full details on the daily operation of the Wiley Laserdisk Service will be provided in the second part of this article to appear in the next issue.

SUGGESTIONS ABOUT THINGS LARGE AND SMALL

1. Patrons really appreciate written documentation that is short and concise. Examples of several of the handouts available for patrons will be included in the next article.
2. Staff appreciate time to get acquainted with a new database before it is placed in a public area.
3. Quick turnaround time on repairs of equipment is essential to keep this extremely popular service operational. We found that patrons quickly notice when a database is not available. Our problem has generally been with one of the disk drives or disk drive controller cards within the computers, not with the CDROM drives. To facilitate repairs, one librarian, assisted by a computer science graduate student whiz kid, coordinates repairs for the Reference Division, makes sure accurate records are kept so warranties can be used when possible, and deals with the campus Computing Services Center, which repairs most of our equipment. Repair costs are averaging $150 per month.
4. The faster the computer, the better. But verify compatibility.
5. When possible, test before buying; always ask about a trial period, with the laserdisk publisher providing at least the laserdisk drive and the database. Some publishers may also provide the microcomputer as well.
6. Consider carefully the possible need for color monitors for those databases which make good use of color. We didn't the first time, but may purchase color monitors for some of the new search stations.
7. If your staff doesn't have the necessary computer skills, consider hiring a computer science student to either do the technical work, or to teach your staff to handle it. Our two students have saved the staff a lot of time and have taught us a great deal. They also are helpful when brand new databases arrive and need installation. Sometimes, strange things happen with new software that only programmers understand. ►



WILEY LASERDISK SERVICE FLOOR PLAN

KEY TO FLOOR PLAN

Wiley Laserdisk Service

1.-4. InfoTrac search stations

5.a&b. Datext CD/Corporate (with Okidata printer)

6. PsycLIT (SilverPlatter)

7. Humanities Index (Wilsondisc)

8. Agricola (SilverPlatter)

9. Applied Science & Technology Index (Wilsondisc)

10. Books in Print PLUS (Bowker)
Out-of-Print Books PLUS (Bowker)

11. Life Sciences Collection (Cambridge)

12. Sociofile (SilverPlatter)

13. Visual Dictionary (Facts on File; test)

14. Vacant workstation for expansion

15. Electronic Encyclopedia (Grolier)
Science Citation Index Permuterm Subject Index (ISI; test)

16. Dissertation Abstracts International (UMI)

17. InfoTrac w/memory partition allowing online access w/modem—for staff use

18&19. ERIC (SilverPlatter)

20. Newsbank Index on CDROM

21. LePac: Government Publications Option (Brodart)
SHIP Disk/Census of Agriculture (Slater Hall)

22. NTIS (SilverPlatter)

23. InfoTrac laserdisk control station—3 players, 1 controller, 1 multiplexer

AIRS Service

24.a&b. IBM PC XT and Okidata printer for online searching

25.a&b. IBM PC XT and Okidata printer for online searching

26.a&b. IBM 3101 terminal and DECwriter

27.a&b. IBM PC AT and DECwriter for online searching

28.-30. Conference stations

31.-34. Bookshelves for manuals

35.&36. Locking file cabinets for documentation and software

37. DECwriter

8. When really technical problems arise, have your technical person talk with the publisher's technical support staff. Don't try to relay your technician's questions to the publisher's sales representative who in turn must relay the question to his technician. You will avoid confusion, save time, and technical staff will be less frustrated than when there are two middlemen.

9. Get some help also with hard disk management. Teach the staff how to manage directories and subdirectories from the start. They may also be apprehensive about downloading.

10. Shop around for laserdisk equipment. The best buys are not always from the database publisher. Do some comparative shopping. Look at MS-DOS compatible microcomputers, which may be just as serviceable, but much less expensive.

11. If you are sure about the potential usefulness of a new database, take advantage of introductory offers, some of which represent considerable savings. Also check with your nearest library network, which may be offering laserdisk databases at good prices. Package deals which include backfiles and current subscriptions also may be good buys.

12. Provide sufficient opportunities for group and individual training for both staff and users. Users will be clamoring for class demonstrations—a large screen projector and a portable computer are essential!

13. Decide in advance how to handle supplies—paper for printing, printer ribbons, etc.

14. Consider your security needs carefully.

FUTURE FUNDING FOR DATABASES

The second gift from the Wileys includes funding to pay for two-year subscriptions to the new databases and for the third year's subscription to the databases purchased initially. After that, the library must seek other funding. Other sources may include additional gift funds or funds from the acquisitions budget, which for the past four years have been used for subsidization of the end-user and graduate student searching programs. As more and more laserdisk databases become available, there should be less need for the library to subsidize the other services.

Cost-wise, the library obtains much more from its laserdisk databases than from the money spent on the end-user searching program. Depending upon the frequency of use and upon database subscription cost, each laserdisk search during the previous academic year cost between fifty cents and $1.35, as compared to an average cost of $5.50 for end-user online searches. The demand for the end-user searching program, however, is still fairly high because so many databases are not yet available on laserdisk. For the immediate future, both types of service will be provided at some cost to the library for both.

Yet another possibility is the cancellation of printed equivalents. We have begun to look at some titles; thus far, the only things canceled were one print index and the companion fiche business tool, *Corporate & Industry Research Reports*, the demand for which went down when Datext was purchased, and the ROM COM Terminal versions of Magazine and Business Indexes, which were partially replaced by InfoTrac. We shall be looking at other titles approximately six months to a year after the corresponding laserdisk databases are obtained, when we can gauge the acceptance by the user, the ease of access, and how well we are able to meet the demand from the patrons with the laserdisk databases. Until the databases are linked via a network so that multiple access can be provided, there will be some databases for which the traffic is so heavy that we would hesitate to cancel the print equivalent.

FUTURE PLANS

Bruce Connolly's "Looking Backwards: CDROM in the Academic Library of the Future," in the May 1987 *ONLINE*, made us realize that we still have much further to go before full integration of laserdisk technology with other library services is achieved.[5] Yet, when we compare where we are with other libraries, we have made significant headway towards providing our patrons increased access to computerized databases through a variety of methods. We have also been successful in promoting these services and in helping users to take fullest advantage of them.

An immediate activity in this direction, to be described in some detail in the second article on the Wiley Laserdisk Service, is an outreach program in which the laserdisk databases will be demonstrated in classrooms. In order to do this, a Compaq portable Model II computer with a hard disk was purchased. Controller cards for both Philips and Hitachi players have been installed in the microcomputer, and it, along with a large screen projector, will be taken to classes for demonstrations. A number of training sessions on CDROM products have already been conducted in the library. While the initial procedure involved rolling the ap-

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propriate microcomputer workstation to our bibliographic instruction room for in-house group presentations, this became a problem because of the brick pavers in the corridors. Shortly after the service became operational, a hard disk head crash occurred on one of the microcomputers when its search station was moved to the instruction room. Since then, we have relied upon portable equipment.

We have learned a lot from serving as a test site for database publishers. During the past year, the Library served as a test site for three different laserdisk databases and will be testing five additional databases during the next year.

We have learned a lot from serving as a test site for database publishers. Serving as a test site has benefited us as well as the publishers. We get a chance to preview products and to have some impact upon their eventual design, and often receive price breaks because of our participation in test programs. Our faculty and students have been impressed when they have had a chance to experiment with prototype products because they realize that we are working at the cutting edge of technology and are doing our part to bring the latest technology to the campus. During the past year, the Library served as a test site for three different laserdisk databases and will be testing five additional databases during the next year. Testing products takes a good deal of planning and organization, but the staff thinks that it is well worth the effort.

One of the things that we are most anxious to see is greater standardization which will allow more interchangeability and make utilization of local area networks feasible. Our original plans called for the linkage of a number of databases in a local area network this year. Because of compatibility problems, this activity will be postponed until at least the next academic year. We also are eager to take advantage of the campus Ethernet network, so that we can make the databases available after hours when the Library is closed. Our computer center is willing to work with us on this, and the Wileys and our patrons are very excited about the possibility.

There is interest among our librarians in producing laserdisk products. A proposal to put an energy database developed at our library on laserdisk will probably be submitted to several funding sources or commercial publishers. The Archives Division of the Library has submitted a proposal to a foundation for placing some of the manuscripts in the Archives on laserdisk, utilizing a scanning technique for digitizing the data. The Library's Development Foundation has encouraged the Library to become pro-active rather than just reactive in passively using information products produced by other organizations. Whether we will be successful in this area remains to be seen, but we are learning a great deal about the technology as we prepare such proposals.

AND MORE TO COME

We have attempted to cover the broader aspects of the acquisition and implementation of the James and Virginia Wiley Laserdisk Service. The second part of this article will focus in greater detail upon the day-to-day operation of the service, on staffing and staff training, user training, publicity and outreach.

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COST TO LIBRARIES OF THE OPTICAL INFORMATION REVOLUTION

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. . .A SURVEY SHOWS DIVERSE FUNDING METHODS

The development of optical technology applications for library information needs has come at a less than ideal time for the target market. Most libraries today (particularly large research libraries) are struggling to keep up with the rising costs of print serials and with rapidly escalating operating expenses, including, but not limited to, automation costs. Yet, laid before us is an alluring new technology which has the potential to provide increased levels of access at a low cost per transaction, and for a fixed and budgetable sum. As with any new technology, the research and development costs are enormous. Until a high volume market is developed and further technological advances reduce production expenses, these R&D costs must be passed on to the consumer.

For library optical reference products to succeed, it seems necessary that libraries join companies in taking risks, and in rapidly adapting to the situations which the technology presents. Most of the products on the market are flawed in a variety of ways and are undergoing continuous refinement. At present, the technology limits response time. Retrieval software for many products needs improvement in terms of access points and protocols. As with previously developed online end-user systems, operation by the uninitiated must be sufficiently straightforward to avoid the system's becoming a burden rather than a help to overworked reference staff. This is still not the case for some offerings. Since products are continually changing, even well-established companies cannot produce completely adequate documentation over the short-term. But, despite all these drawbacks, for optical reference tools to improve, libraries must buy them.

These systems also require libraries to invest in new kinds of equipment without a full understanding of obsolescence rate or of how (or if) database producers are going to deal in the long-term with replacement or upgrade issues. Supplies to support the systems, personnel to maintain them and instruct in their use, equipment and long-term maintenance costs are all open issues for libraries.

Simply to be at the cutting edge, or based on the hope that they will be providing services which will represent a quantum leap in information access for users, libraries are providing some of the venture capital that the fledgling optical information industry needs to survive and expand. Given the budget constraints that many libraries now face, how are they doing it?

What follows is not the definitive answer, but simply the results of an impressionistic poll of colleagues at like institutions (i.e., primarily research libraries) as to their plans, practices and strategies in relation to optical reference tools.

GETTING STARTED

The informal survey which forms the basis of this article indicates that a surprising number of institutions are using non-recurring funds to purchase not only the equipment to support optical reference systems but also the database subscriptions. The types of funds which have been employed include the following: private gifts, endowment funds, foundation grants, one-time university grants for expanding computer use on campus or for improving undergraduate instruction, state grant programs for similar purposes, discretionary funds at the disposal either of the library or the campus administration, and, in at least one case, LSCA (Library Services and Construction Act) money.

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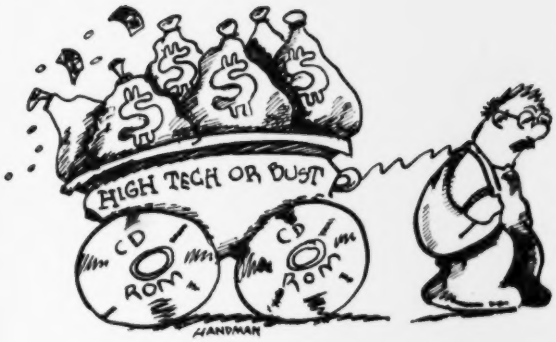

In institutions where equipment monies and materials monies are normally never used interchangeably, the distinction has become blurred or at least temporarily suspended. At the University of North Carolina, where a relatively strong commitment has been made to optical reference technology, Director of Public Services, Karen Seibert, reports that endowment income has been used to purchase several systems including Bowker's **BIP Plus**, **Ulrich's Plus**, SilverPlatter's **ERIC** and **PsycLIT**, and **Compact Disclosure**. These are located, along with access to BRS/After Dark, in a separate end-user search area in the reference room. There is also a four-station InfoTrac unit in the Undergraduate Library. The initial sum committed to the installation was $40,000 and the library will request additional $40,000 ($10,000 of which is to be used for new tools) for the second year of the program. These funds are not generally used for continuing subscriptions and a special dispensation was necessary to employ them for the purchase of equipment. Since second year funding from the endowment source is uncertain, the library is continuously evaluating the program.

Two libraries have received large private grants to pursue the use of optical technology. Texas A&M's Sterling C. Evans Library has benefited from a $100,000 gift from an alumnus which has been used to establish a ten-station laserdisk search installation. [1] The Jean and Alexander Heard Library at Vanderbilt University has obtained a grant of $750,000 from the Pew Memorial Trust which has been matched by an additional $200,000 from the University to provide user access to multiple information sources beyond library holdings. The CDROM portion of this Enhanced Information Project is only a small part of plans to provide article-level and full text access through the library's online catalog. [2]

Texas A&M's CDROM experiment is the most ambitious that this author has encountered. A separate laserdisk search area has been established in the reference room. Databases purchased thus far have cost $40,550. Equipment costs and installation accounted for the use of the remainder of the $100,000, with an average workstation (including either an IBM PC XT or IBM AT) costing $5,100. It is estimated that the number of end-user laserdisk searches to be done during the center's first year of operation will be a remarkable total of 67,000. Taking into account only continuing operating costs this yields a per transaction cost of less than 50 cents.

Vanderbilt's grant-supported optical program is more decentralized and, at least at this time, not quite so extensive. The Peabody College of Education Library now has both the DIALOG and the SilverPlatter versions of ERIC. The school of management library has DATEXT and Brodart's Government LePac is also in use at Vanderbilt. Ten optical workstations have been purchased with grant funds.

The three institutions whose programs are briefly described above, are representative of others which have used grants or other non-recurring funds to purchase optical information systems on a smaller scale.

Of course, many libraries have financed the acquisition of laser reference tools in more standard ways. At the University of Texas, for example, a trial period with InfoTrac led to a request for continuing additional funding to the library administration. Thus far, Indiana University has been able to finance purchase of a fair array of systems (three databases from SilverPlatter, BIP Plus, Wilson's **Social Science Index Ondisc** and their **Humanities Index Ondisc**, as well as **Dissertation Abstracts Ondisc**) largely from an adequately supported reference materials budget. Even at Indiana, however, some special arrangements had to be made for the purchase of equipment.

CONTINUED FUNDING: TRADEOFFS AND OPTIONS

When libraries become involved with optical reference technology using non-recurring funds, or when they accept trial subscriptions of popular tools which generate user pressure to continue purchase, they are faced with integrating what are usually fairly expensive annual subscriptions (essentially costly new serial titles) into already strained materials budgets. Institutions have used a variety of strategies to cope with this problem.

The best solution, if startup has been accomplished with "soft" money, is clearly to arrange for continuation from the original source. As mentioned earlier, this is the University of

North Carolina's hope. For Texas A&M the hope has already become a reality. A second year of financing at A&M will assure extensions of existing subscriptions as well as purchase of new tools. Even more significantly, additional funds will also allow experimentation with an important extension of the technology, namely, the use of a local area network to permit multiple user access to at least eight, and possibly more of A&M's optical reference systems.

Even in Texas, however, the donor's generosity cannot be expected to continue forever.

Even in Texas, however, the donor's generosity cannot be expected to continue forever. After the third year, A&M faces absorption of on the order of $100,000 in continuing subscription costs into the materials budget. A certain amount has been anticipated through early cancellations. When InfoTrac was purchased, *Magazine Index* and *Business Index* were canceled, along with another business-related tool, *Corporate Industrial Research Reports*. Present plans are to cancel *Dissertation Abstracts* once the CDROM version has taken hold. However, still more elaborate contingency planning has been undertaken. The library has put forward a five-year enrichment plan to the university administration which includes permanent funding of laserdisk technology. Considering the vagaries of state support (and, in Texas, of oil income), it would be foolish to count absolutely on such new monies. There are other options to consider and Texas A&M's are not too different from those open to other libraries. How each library approaches the array of funding options available is of course quite dependent on how materials and other budgeting is done and by whom.

- **Cancellations**. Many libraries who acquired InfoTrac and subscribed to the *Magazine Index* and the *Business Index* have canceled these more or less immediately. It is less common for libraries to view the CDROM version as a substitute for a print tool, although some librarians are willing to begin thinking along those lines. Ready online access for current information is required. Frequency of use is also an important factor in the decision to cancel. At the Peabody College of Education Library at Vanderbilt, where there are three workstations that can be used for ERIC searching and the hope is to have four before long, Mary Beth Blalock believes that use of the printed index should be carefully monitored. However, cancellation of the index is only one of several options being considered for permanent funding in this situation, and then only if application to the College for additional funding proves unsuccessful. [3] Vanderbilt, like many other libraries, is simply regarding a CDROM subscription as an expensive serial whose purchase must be managed like any other. In this case, cancellations in related as well as unrelated areas are brought into play.

Since at some institutions, reference departments do not have separate serials allocations which are under their own control, heads may have to apply to collection development staff for new funding. It is the job of the collection development staff to balance these requests against others. The argument may be made that, while optical tools are a convenience to the user, they frequently contain nothing new in terms of content.

Some libraries with strong commitments to laserdisk reference tools, will take the only approach available in a fully allocated materials budget. That is, to set aside monies to pay for optical tools before the rest of the library budget is allocated, thus taxing all subject areas to pay for the new technology. As Ann Bristow Beltran points out in her recent article in the *Journal of Academic Librarianship* on the general subject of financing automated information retrieval: "The fear exists that increased support for automated information sources is likely to come from funds supporting disciplines in which automated systems are less available and important." [4] Beltran believes systems are developing for all disciplines, but over the short term, it certainly seems likely that many libraries will divert funds from various areas to general subject fields and the social sciences, where laser technology now has the strongest hold.

- **Laserdisk as a Replacement Technology**. Online ready reference searching can frequently be done quite effectively with optical tools. The costs of this service, which are normally part of the operating budget, represent a potential source of support for laserdisk searching. Mediated online searching also presents possibilities for some cost shifts, depending on how this service is funded and on the level of subsidy ►

to users. This option is being considered by the education library at Vanderbilt, where the subsidy to searching is rather small. It is also a longterm tradeoff for Texas A&M. Here, with an ambitious end-user searching program, and provision of one free mediated search to each graduate student each academic year, the subsidy to searching is large (this year amounting to $87,000). Libraries have also built up equity in other approaches to large scale information retrieval in certain subject areas, which can be diverted to the support of optical access. The University of Texas, has addressed the needs of users for access to the literature of psychology and education by subscribing to the ERIC and **Psychological Abstracts** tapes, and mounting these on a small computer with hardwired terminals in the library. Searches were done by intermediaries, and, to prevent overloading the staff, they had to be limited to 20 per day. With the purchase of SilverPlatter's ERIC and PsycLit, this service has been eliminated. SilverPlatter software provides more powerful access to the information on the tapes and the number of searches will obviously now be limited only by user inclination and machine availability.

- **User Fees**. Most libraries are staunchly opposed to charging users for use of optical reference systems as a defeat of their central rationale. Yet at the University of California at Berkeley, charging for InfoTrac use seems the only way to maintain a popular service. A use fee of eight cents per minute is charged for InfoTrac searches. Charging is accomplished through vendacards, but it is not yet known how much income has been acquired in support of the tool. Since patrons had been accustomed to a free service, use fell off immediately, but is slowly edging back up. Those new to the university may not find it strange at all to pay for a convenient service. Berkeley is using a vendacard system to charge for printing as well. According to Milt Ternberg, business librarian, neither the search charge nor the print charge (12 cents per minute) seem likely to result in total cost recovery.

HIDDEN COSTS

Libraries have found that certain systems place a significant drain on the supplies budget. It is estimated that keeping an InfoTrac station in paper and inkjets for a year of heavy use costs from $1,000 to $2,000. With multiple stations and other systems contributing, the library with a large optical reference installation may find that the funding of daily operations soon becomes a significant issue. The ERIC database is another potential problem, since users may frequently wish to print hundreds of citations.

Berkeley is using a vendacard system to charge for printing as well. . .IAC is considering disabling the "print screen" command and limiting printing to citations which must be culled by the users and identified as relevant before printing.

Berkeley's charge system for printing on InfoTrac has already been mentioned and may be adopted by the Information Access Company as an optional feature. IAC is considering disabling the "print screen" command and limiting printing to citations which must be culled by the users and identified as relevant before printing.

A few libraries have decided that they are willing to put up with the noise of low cost, "no fuss" impact printers and have substituted these for the intensive maintenance, but quiet Thinkjet. This reduces cost through the elimination of inkjets (which have a high per/unit price tag and are not long-lived) and also reduces staff and user frustration occasioned by the frequent changes necessary. Another cost avoidance technique for excessive printing is to encourage users to bring a floppy disk and download their data.

Staff support must be addressed as a potential additional expense by libraries with sizeable optical reference installations. It is generally agreed that, aside from InfoTrac which truly *is* user-friendly, most systems require some instruction to users. Much of the documentation available is deemed not appropriate, or insufficient for direct patron use, and librarians have developed their own instructions. Staff must also be on call to provide advice as needed by the patron in the midst of a search. Equipment problems need to be attended to: routine maintenance (paper changes, inkjet changes, ribbon changes, etc.). Software updates must be installed. Breakdowns must be evaluated and dealt with. The number of chores increases with the number of different systems available, as does the burden on the reference staff who must remember each system's conventions.

The pressures listed have led to a reallocation of staff at two institutions with heavy commitments to laserdisk reference technology: Indiana University and Texas A&M. At Indiana the departmental secretary's workload had been reduced due to heavy staff use of microcomputers for typing. This position has been assigned to the instruction/maintenance function for optical systems. The laserdisk search area is combined at Texas A&M with an area for online searching and for end-user online searching. This service point is staffed days, evenings and weekends by either one individual or two, depending on perceived need. Staff employed are a mixture of librarians, clerical, and high level technical staff. No new positions have been added to accommodate the various functions, so these individuals have had time reallocated from other duties. With the addition of optical reference technology on a large scale, it is expected that staff responsibilities will shift from mediated online searching to support of laserdisk searching.

OTHER COST SAVINGS OPTIONS

Discounts through Networks. It is becoming common for cooperative networks to offer discounts to their constituencies on subscriptions to optical products. The amount of the discount varies from product to product and from network to network. The networks provide various group discounts to their participating libraries, and they see this service as an extension of their online searching and other instructional and promotional programs. The suppliers, especially those which have not yet developed a national product support base, see this as a help in marketing and maintenance. As of this writing, SilverPlatter had signed discount agreements with AMIGOS (Southwestern states), BCR (Rocky Mountain states), CAPCON (Washington, D.C. libraries), INCOLSA (Indiana), MINITEX (Minnesota), MLC (Michigan), PALINET and PRLC (both Pennsylvania). Networks will offer competing products, (e.g., DIALOG's ERIC) at a discount. Thus, the offer of a discount does not represent a product endorsement.

Provider's Incentives. Optical information providers are increasing purchase incentives in a variety of ways. To the trial subscription, they have added discounts on more than one copy of a given database, discounts on optical equipment, as well as special offers of various kinds. According to Ron Rietdyk, Vice President of SilverPlatter, the company is considering extending licensing agreements which would allow libraries to purchase multiple copies of a database at a greatly reduced price, for example, 25 copies for $1,000.

FUTURE COSTS

As to the costs of disks themselves, it is widely thought that competition has brought down the price of SilverPlatter's ERIC. However, according to individuals in the industry, lasting and beneficial price drops can only occur when the sale of optical disk reference systems reaches a high volume. Decreases would also be helpful by developments in technology which would permit more efficient and timely production of updates. The effects of other developments (improved software, data compression and advances in the layout of data on the disks) are more problematic. One factor which works to make subscriptions more expensive, is the bundling of more databases on the disk or the addition of enticing new features. A good example of the latter phenomenon is Bowker's addition of **Book Reviews Plus** to BIP Plus. Buyers will still be able to purchase BIP Plus alone, but, for a small additional amount, they can supplement bibliographic information with critical annotation. According to SilverPlatter's Ron Rietdyk, laserdisk prices will be driven up if database producers note a dramatic migration of income to that format at the expense of other means for delivering their product; that is, in print or online.

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Equipment and related costs are also a question mark for libraries. Databases will grow bigger and occupy more disks. At the moment, multidisk CDROM databases rely on the user or the librarian to change the disk and this situation has not generated enough negative feeling to force change. It is, of course, technologically feasible to search at least four disks simultaneously by using software adapted to this purpose, and mounting the database on drives which are chained together. More sophisticated software is required and probably a change in the way the data is stored on the disk. Such changes would seem likely to involve more development or production costs that would have to be absorbed by the consumer. Although the price of disk drives is ►

dropping rapidly, the cost beyond two would surely have to be more than the original cost of one.

CONCLUSION

The foregoing impressionistic view seems to indicate a lot of optical dabbling, but not necessarily a high level of continuing commitment. Mostly, money is tight, but, for some, other technologies beckon. Perhaps the best answer for libraries wanting automated access to large databases is to mount tapes along with their own catalog on a mainframe computer to be searched using the catalog's familiar command language. On the other hand, there seems an obvious niche for optical technology in smaller libraries and for certain databases with defined audiences. InfoTrac on a mainframe is out of the question; yet it performs a useful and evident function. Also, there seems a sensible limit to the number of databases to be given full MARC treatment and obviously some will prove more intractable than others.

Perhaps the best answer for libraries wanting automated access to large databases is to mount tapes. . .

It really is not safe to say CDROM is here to stay, but in evaluating it, librarians should take into account the delight of the user in this technology. Perhaps a little reminiscent of joysticking through Space Invader, the user opens new worlds of information with the touch of a few buttons. It is the knowledge seeker's own ship to be flown single-handedly and freely to any subject in the universe of information on the disk. There is pure enjoyment in this, as is shown by the comment from a Decatur, Illinois user of a CDROM test catalog of the University of Illinois Library's holdings: "It was like getting a bouquet of roses."

REFERENCES

[1] Kathy Jackson and associates presented a poster session on June 27, 1987 at the American Library Association annual convention. The facts presented regarding Texas A&M's optical program are based on the handout provided for the session: "Costs and Staffing Required to Operate a Ten-Station Laser Disk Service in a Large Academic Library" and lengthy conversations with Kathy Jackson.

[2] For further insight into Vanderbilt's overall plans for an enhanced information program, see "Optical Discs for Storage and Access in ARL Libraries" *ARL Spec Kit* #133 (April 1987) pp. 68-71; 109-110. For details on the use of the CDROM in the Peabody College of Education Library, see Jean Reese, "Vanderbilt Enhanced Information Project: The OCLC/CD Search Component in Test," *Optical Information Systems Update/ Library and Information Center Applications* (March/April 1987), pp. 1-11. Also see "ERIC on CDROM: A Comparison of DIALOG OnDisc, OCLC's Search CD450 and SilverPlatter" by Jean Reese and Ramona Steffey, in September 1987 *ONLINE*, pp. 42-54. The full-text of the article is also on DIALOG, **File 170, The Online Chronicle**.

[3] Libraries are reluctant to cancel print indexes for more than one reason. An important one to consider is that most CDROM product licensing agreements specify that the purchaser no longer owns the database when the subscription is canceled.

[4] Ann Bristow Beltran. "Funding Computer-Assisted Reference in Academic Research Libraries," *Journal of Academic Librarianship* v. 13, no. 1 (March 1987), p. 7.

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BOOKS IN PRINT AND ULRICH'S ON CDROM: A PRELIMINARY REVIEW

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Books in Print and *Ulrich's International Periodicals Directory* from R.R. Bowker Company, have been fundamental sources in most library collections for many years. Bowker's early conversion of *Books in Print* and *Ulrich's* to CDROM, has prompted additional enthusiasm and confidence in a microcomputer technology which has had great promise but few products. CDROM is capable of providing users with local access to information about current books and periodicals which has not been possible previously.

In the Academic Affairs Library at the University of North Carolina at Chapel Hill, the exploration of the utility of microcomputer-based data files has been underway for several years. CDROM is one of the technological formats which fueled the early interest in such data sources. A prototype Machine Readable Data Files Center for microcomputer data was established in 1985, and an end-user searching program was initiated in 1986. The Bowker CDROM products at UNC are accessed through the use of an IBM PC with 640K, a color monitor, and a Hitachi CDROM drive. In addition to the Bowker CDROMs, a number of statistical data files on floppy diskette and several other CDROM products including Compact DISCLOSURE, and ERIC and Psychological Abstracts from Silver Platter are available in Davis Library.

DESCRIPTION OF THE PRODUCTS

Ulrich's Plus and Books in Print Plus on CDROM, provide users with information contained in the printed volumes of both works, but not searchable in print. The products provide access to each word in titles rather than just the first word. They allow searches by combinations of concepts such as by publisher and year of publication and price. These CDROM products broaden the type of inquiries which users can conduct with the information available from Bowker.

The aim in subscribing to these products on CDROM is to offer unlimited local access to these Bowker databases, without the connect charges which are a part of the online versions. Searching the CDROM is generally efficient and the software is essentially the same for both products. As reported in UNC user evaluations, the system is easy to learn.

Each of the products consists of a single CDROM disk containing the complete database, a floppy diskette for the "A" drive which holds the system software, and a work diskette for the "B" drive holding both downloaded citations in user named files and intermediate search results in a spill file. The spill file makes retrieval slightly faster.

DATABASE CONTENTS

Books in Print Plus includes not only information from the printed *Books in Print*, but also from the *Subject Guide to Books in Print*, *Forthcoming Books*, the *Subject Guide to Forthcoming Books*, and the *Books in Print Supplements*. Bowker reports that this database totals nearly 900,000 records. The advantage of having this large database accessible with the microcomputer is that very precise searches combining a number of elements can be executed. Search results can be downloaded to floppy disk for use with other programs such as a word processor. Results can also be printed in appropriate formats for a number of different uses. Collection Development staff, for instance, might wish to print brief bibliographic information with the Library of Con-

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gress card number while library patrons might prefer to print simple author, title, and imprint information.

Ulrich's Plus, like Books in Print Plus, combines the text of a number of products. In addition to *Ulrich's International Periodicals Directory*, the Ulrich's Plus CDROM includes *Irregular Serials and Annuals*, and access to information from the **International Serials Database**. The compact disk version allows access through keywords in titles, truncated titles, and sources in which periodicals are indexed. Being able to combine these search elements in a single search query is one of the great advantages of Ulrich's Plus.

THE SEARCH SOFTWARE

The software packages used with both Books in Print Plus and Ulrich's Plus are similar, varying only in the fields which can be searched for the two databases. Screens and menus work the same way in both databases. The software is based on a system of menus which overlay each other as you proceed through each step of a search and disappear as you use the escape key to return one step toward the main menu.

Bowker has made extensive use of colors and graphics in order to make the databases easier to understand.

Bowker has made extensive use of colors and graphics in order to make the databases easier to understand. Prompts at the bottom of the screen direct users to the next logical steps in their search. The IBM's function keys are used to execute printing, file saves and other operations. The F1 key provides access to the help system.

The software can be used in a novice mode which is menu-driven and very easy to understand, or it can be used in the expert mode. The expert mode allows searches to be conducted without the constant intrusion of the program to prompt the next step. The novice mode does not significantly slow the process of the search but the prompting is simply unnecessary for frequent users. There is no difference in the power of searching whichever mode is chosen.

Flexibility is one of the hallmarks of the system. Users can choose search modes and the format in which information is displayed. The default display format resembles the printed *Books in Print* or *Ulrich's* entries. Users can also select a catalog card format, a MARC Tagged format, or an order form format (which generates a form similar to a printed order card). There is another important format called the order format which assembles the data so that it is acceptable to send online to most book jobbers. The order format is different from the order form format and probably should be renamed by Bowker. This order format might more simply be called an online format to avoid confusion with the name order form format. The ability of the Bowker system to prepare orders for online transmission to jobbers is a feature which will prove very useful in some settings. The detailed format includes all information relevant to each individual item in the database. The custom format allows users to select from the available fields to generate a specialized record display.

Search statements are entered in a format somewhat similar to that used in searching the Additional Indexes fields in DIALOG. Each direct search request begins with an abbreviation for the type of search (eg. **kw** for a **keyword**), followed by an operator symbol such as an equal sign, followed by the word or words which are to be searched. For example, a search for the word "shark" in a title or in other searchable fields would be formulated as **kw=shark**. The operator symbol can also be ">" or "<" to retrieve items in alphabetical or numeric order which are greater or less than the word entered. This function is a dangerous one because processing the command can take so long. A search for all keywords greater than zebra (**kw > zebra**) retrieves over 10,000 citations and takes several minutes. Fortunately, the software will stop the search at any time the user presses the Escape key. There are provisions for truncating terms and for combining sets in order to narrow retrieval.

In addition to direct searching, there is a browse option which gives access to the indexes on the CDROM disk. This function allows the user to type in a relevant term and page through the indexes in order to determine the exact term.

After a relevant set is selected from the index or through direct searching, a brief display of the records appears. The brief display in Books in Print Plus consists of the author name, up to 26 characters from the title, the price, the date of publication, and the ISBN. In Ulrich's Plus, the brief display consists of a truncated title of up to 46 characters, the subscription price, a circulation figure and the ISSN.

From the brief displays of items, users can select citations for a full display of the records in whatever format they have chosen. This process of choosing or paging through the brief records is the slowest part of the search system. Each choice of a citation takes about two seconds. If the retrieval set is larger than about

20 citations, this is a problem. Both the brief display and the full display appear as overlays on top of the previous screens. After the records are chosen from the brief display, it is possible to display the records in their full format, to print the records, or to write them to a diskette file for further manipulation.

USER ASSISTANCE AND DOCUMENTATION

Assistance to users is provided in three ways. First, there is a contextual help system which is a series of screens that describe whatever function is currently in use. Secondly, there are manuals for both products which describe the options along with detailed searching information such as country codes. The manuals also include step-by-step instructions on installing and setting up the software and hardware. The Ulrich's Plus manual includes a general index but, thus far, the Books in Print Plus manual does not. Finally, Bowker has a toll free number for further assistance with the software or hardware. Overall, the system is remarkably well supported in comparison with many of the other CDROM products now available.

COSTS

A one year subscription to Books in Print Plus is currently $895.00. A one year subscription to Ulrich's Plus is $395.00. A joint subscription program for both packages is $1,199.00 (a savings of $91.00). This compares favorably with the printed versions at a cost of $808.90 for all the sections of *Books in Print* and $299.90 for a subscription to the printed versions which comprise *Ulrich's Plus* (total for all the print products: $1,108.81). Bowker is also offering discounts on multiple subscriptions to the CDROM databases at a single institution.

The cost of the hardware as installed at UNC is $780.00 for the Hitachi CDROM drive and controller card, $3624.00 for the IBM PC with monitor and all necessary accessories, and $500.00 for a good quality dot matrix printer. The total for this setup comes to $4824.00. This workstation will operate all of the CDROM products which are currently available at UNC.

The cost of the hardware as installed at UNC is $780.00 for the Hitachi CDROM drive and controller card, $3624.00 for the IBM PC with monitor and all necessary accessories, and $500.00 for a good quality dot matrix printer. The total for this setup comes to $4824.00.

LICENSE AND SUBSCRIPTIONS

One aspect of the Plus system which differs from subscription agreements typical for print products is that subscriptions to Bowker CDROMs permit use of the products for a specific period of time; they are not permanent purchases. These subscription arrangements mean that if the library decides not to renew the subscription, the compact disk, software, and all documentation must be returned to Bowker. This practice is becoming the norm for CDROM subscriptions and is not limited to Bowker publications.

These subscription arrangements mean that if the library decides not to renew the subscription, the compact disk, software, and all documentation must be returned to Bowker.

When the quarterly updates to either Ulrich's Plus or Books in Print Plus are received by the subscriber, the older version of the compact disk must be returned to Bowker. This means that a single subscription to the product cannot be passed from one department of the library to another. It also means that subscribers have no archival copies of the database. This practice, while understandable from Bowker's point of view, is not in keeping with the policy of many libraries of retaining older versions of printed copies. Therefore, a printed subscription must be maintained if a library wants an archival copy. While this may not be a problem currently, it could prove to be a concern over the long run. Few libraries with multiple subscriptions to *Ulrich's* or *Books in Print* will cancel all printed subscriptions and switch exclusively to CDROM; Bowker's policy reinforces this behavior.

HOW THE BOWKER DATABASES ARE BEING USED

During the two months that Ulrich's Plus and Books in Print Plus have been available at UNC, the majority of the 43 uses have been by library staff. The most frequent application

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has been for quick reference work, and the remainder primarily for collection development. The process of educating library patrons and staff and helping them understand Ulrich's Plus and Books in Print Plus is in its early stages at UNC.

A typical question which demonstrates the use of Ulrich's Plus was a request in the reference department to find out what journals a particular individual edited. Using the editor index, this information is accessible on the CDROM, although it is not possible to search this information in the printed source. Another example, this time requiring the use of Books in Print Plus, was a search to identify a book of short stories with the word "river" in the title published by the University of Chicago Press. Again this type of search is not possible in the printed version. Such access to the important data which are not indexed in the printed versions, are among the features which set an automated version of the Bowker databases apart from their print counterparts.

Such access to the important data which are not indexed in the printed versions, are among the features which set an automated version of the Bowker databases apart from their print counterparts.

At present, relatively few library patrons have used the Bowker databases because they are not familiar with the concepts of using the CDROM. One of the problems of introducing a new set of bibliographic tools to a university community is that the process of educating users about new resources must wait until the users have questions for which the sources are useful. Library staff have been trained in the use of these materials, and eventually, through referrals, a larger number of users will be exposed to these products.

Although the printed Bowker products are used heavily by staff and patrons alike, few librarians I have talked with expect the CDROM counterparts to excite enthusiastic hordes of users. It is difficult to conceive of a setting in which Ulrich's Plus and Books in Print Plus would generate sufficient demand to require a dedicated workstation. Fortunately, other CDROM products can be used at the same workstation making the equipment investment more manageable. Although the Bowker products may not set records on the CDROM bestseller list, they are so well done that there should be a strong market, and they may continue to serve as benchmarks with which other CDROM bibliographic databases can be compared.

COMPARISON OF THE CDROM AND ONLINE VERSIONS

In addition to the printed and CDROM versions of *Books in Print* and *Ulrich's*, both products are also available online from BRS and DIALOG. A comparison of the features and costs of the online versions with the CDROM versions sheds some interesting light on a possible choice among the products.

Neither the online versions nor the CDROM version of these databases are as quick to use as the printed sources. The necessity of starting up the compact disk system or dialing the online service, takes as much time as looking up an entry in the printed versions, in many cases. The tradeoff, of course, is that the printed source is not as powerful as either of the automated versions.

CDROM technology has a reputation for being slow compared with online technology. Overall, this is true.

CDROM technology has a reputation for being slow compared with online technology. Overall, this is true. In a test of the amount of time required to boot the systems, dialing in to the online sources was slightly quicker than booting the CDROM versions. The average time to connect to the online version was 54 seconds; the average time to boot the CDROM version was about one minute and 15 seconds. Perhaps surprisingly, the seek time to complete a specific title search was shorter in the CDROM versions, averaging four seconds, compared to eight seconds for the online products.

Combinations of large retrieval sets such as the book with the word "river" in the title published by the University of Chicago Press, gave an edge to the online versions averaging eight seconds online and twelve seconds for CDROM. As was mentioned earlier, the CDROM version is much slower in printing or displaying full citations because the process of choosing items from the brief display is so tedious. In the online version, these steps seem immediate.

One of the major selling points of compact

disk products is that the meter is not running when the system is being used. Online searching charges are primarily by the minute; CDROM time is a fixed cost for an entire year. In a setting in which inexperienced end-users are working with the system, such a factor cannot be discounted. With reference to the tests cited above, it was clear that a user who was less familiar with the systems and software would not have completed the tasks as quickly.

The online versions of the databases are more up-to-date than their CDROM counterparts; online versions are updated at least every six weeks ,whereas the CDROM products are updated quarterly. In addition to more frequent updates, the **Books in Print** database includes bibliographic information back to 1979. The CDROM databases only include current data. Using the online versions to supplement the CDROM is a possibility worth considering if such access is required.

The records available in the online and CDROM versions are virtually identical; however, certain types of searches are possible in the CDROM versions that are not possible online. In Ulrich's Plus on CDROM, for instance, editor names can be searched directly (as in the example above). In the online version from BRS, editor names can be displayed but they cannot be searched. (In DIALOG, editor names can be searched directly.) In Books in Print Plus it is possible to execute a search for all books whose price exceeds a certain amount. An interesting point to note here is that a search of Books in Print Plus for all entries with prices greater than $5 took over five minutes and retrieved more than 600,000 citations. The price will display in the online versions but is not searchable.

The CDROM versions of Ulrich's Plus and Books in Print Plus are much more forgiving of the errors that end-users are likely to commit than either of the online versions are.

The CDROM versions of Ulrich's Plus and Books in Print Plus are much more forgiving of the errors that end-users are likely to commit than either of the online versions are. In addition to the extensive help systems and documentation provided, the prompts that are always on the screen directing the next step seem comforting to new users.

The processing power of the mainframe computers of DIALOG and BRS allow retrieval of large sets, and efficient manipulation of multiple sets. By comparison, the CDROM product depends on the relatively weak microcomputer and cannot handle large retrievals or the combination of large sets easily. One of the problems with the CDROM versions of the databases is that searches with very large result sets (eg. Smith as an author) can take over a minute to process. Although broad searches are inefficient, in practice, they are sometimes necessary and end-users frequently execute such strategies. When large sets are retrieved in searching the CDROM databases, the intermediate results are written to a spill file. In an all floppy diskette system, this spill file will occasionally overflow, ending all processing. This should not happen with a microcomputer with a hard disk. If a large number of sets are in use on the CDROM versions, the user is sometimes instructed that the search workspace will become full and that sets should be deleted in order to continue the search. This practice is inconvenient, but it can also be confounding if users delete sets which are needed in further searching. Again, a hard disk microcomputer will help avoid this problem.

CONCLUSION

CDROM technology is still relatively new in many libraries. A great deal of expectation and enthusiasm has been generated for products which are only now becoming widely available. Ulrich's Plus and Books in Print Plus are among the better CDROM products currently on the market. The search software works well and the products are adequately supported by the Bowker Company; further development of these products, such as resolving the delays in retrieving records for the indexes and brief displays could make them even more useful. At present, the utility of the databases in any particular setting must be weighed against the costs of access to the printed versions, and to online versions. The limitations outlined in this article may not be problems in some settings; the ability to provide these databases in a powerful automated form and to provide users with an up-to-the-minute information technology is very appealing. The high quality of the databases on which the CDROMs are based and their appeal to a broad range of users, ensure that Ulrich's Plus and Books in Print Plus will find a place in many library settings.

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DIALTWIG: A MINI-DIALOG IN A CONTROLLED, MICROCOMPUTER-BASED ENVIRONMENT

by Marsha D. Broadway
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Brigham Young University

Two years ago when I joined the faculty of the School of Library and Information Sciences at Brigham Young University, Keith Stirling was putting the final touches on Version 2.0 of DIALTWIG. This DIALOG emulator was originally conceived to train graduate library science students in online bibliographic searching, to provide in-house databases of students' research projects and library science literature, and later to teach database building skills. Excited at the prospects of inexpensively integrating online searching into the basic reference theory and services course, I immediately built a tiny database of 15 downloaded **ERIC** records. Performing the ERIC search, stripping the search results of unwanted information, reading the instructions, using the DIALTWIG file building programs, and writing an assignment for searching the new database took about four hours. (Of course, Keith Stirling was in the office next door to answer my questions.)

This original 15-record mini-ERIC database was useful in providing a hands-on introduction to online searching, but we needed a larger database to teach search strategy. That second database was built the following year, and used with success and positive student reaction. (See sidebar)

With Version 2.1 of DIALTWIG recently completed, I intend to create additional databases to accompany assignments expanding the online searching instruction in the reference course.

DIALTWIG 2.1 SOFTWARE OVERVIEW

DIALTWIG Version 2.1 is a microcomputer-based package that produces databases which emulate the database formats and command structure of DIALOG. DIALTWIG 2.1 consists of seven 5 1/4" disks. Two disks, Phase I and Phase II Database Files, are the file building and automatic indexing programs. The Program Disk is the operational program that allows the databases to be searched. Four additional disks contain three databases: 1) an ERIC mini-database with 100 downloaded records on online searching, including records on the use of the front ends, interfaces, and gateways; 2) Information Science Files with 400 original bibliographic records of information science literature published prior to 1970; and 3) School of Library and Information Sciences Source Files with 360 original bibliographic records of research projects completed by graduate students in the School of Library and Information Sciences at Brigham Young University.

HARDWARE SPECIFICATIONS

DIALTWIG runs on an IBM PC, XT, AT or a compatible microcomputer with DOS 2.0 or greater as the operating system. Two disk drives or a hard disk is required. The minimum memory requirement is 256K; and the larger the memory, the larger the database can be. A monitor and printer are needed for visual display and hard copy of searches.

DOCUMENTATION

The DIALTWIG software is accompanied by a manual that provides instruction in the use of the file building programs. This manual is a revision of the Version 2.0 manual, which was tested for effectiveness. Graduate students who used the 2.0 manual, and had their questions answered by a teaching assistant, experienced a 100 percent success rate in creating databases. The manual provides descriptions of the programs' functions, examples of the data before and after each program is run, printouts of the screen displays, instructions in how to operate the programs, and examples of the output of the programs.

Currently, documentation does not include instructions for preparing the source file from which the database is built. The process for DIALOG records is rather simple and is explained later in this article.

Database searchers have an online tutorial on the Program Disk that provides a system overview, defines the functions of the commands, and gives examples of correct command structure. The tutorial is accessed through the **?EXPLAIN** command or by typing a question mark and the command that the searcher wishes to review. If the searcher does not recall the **?EXPLAIN** command, she or he needs only to type the word **HELP** to be reminded of the command. To help the searcher determine the structure of records in the database, the **?FIELDn** command will produce a list of the fields and examples of how to search them.

PERSONALIZED SUPPORT SERVICE

A telephone call to Keith Stirling, the producer of DIALTWIG, during weekdays will usually resolve any problem that the user might have. Stirling is very familiar with the program, and can translate a verbal description of a problem so quickly that the answer is found within minutes. As a busy full-time faculty member, Stirling is not always at his tele-

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phone (801/378-2976), and you may have to wait for a return call.

DATABASE BUILDING WITH DIALTWIG

Databases may be compiled from either original data records generated by the user, or data records downloaded from nine DIALOG databases. Those nine databases are ERIC, **GPO MONTHLY CATALOG**, **AGRICOLA**, **SSIE CURRENT RESEARCH**, **FAMILY RESOURCES**, **MENTAL HEALTH ABSTRACTS**, **SOCIOLOGICAL ABSTRACTS**, **BIOSIS PREVIEWS**, and **LISA**. Some of these databases are coyrighted and proper authorization for use must be obtained through the database supplier or producer. Terms and conditions for each database differ.

According to information provided by the producer, the maximum number of data records in a DIALTWIG database is 65,535. For each record 64 different logical fields may be separately indexed; the length of a field cannot exceed 1000 words; therefore, the maximum length of a record would be 64,000 words. Approximately 4000 occurrences of a term or phrase in an index file are possible. Auxiliary programs that generate a rank order frequency distribution permit identification of terms that exceed the limit.

If records are downloaded from a DIALOG database, they should be downloaded in the most complete format available. No instructions are included in the DIALTWIG documentation for stripping DIALOG search results of unwanted search statements to prepare the source file. The database builder should use a text editor, such as P-Edit, to remove all text that is not part of the records. Command statements, posting results, set numbers, DIALOG error statements, etc., should be deleted. A blank line may be left between each record for ease in reading the file. The last line of the source file will not be indexed if a hard carriage return is not placed at the end of the file. In order for records to appear in reverse chronological order (most recent record first) during search episodes, the source file must be arranged in reverse chronological order. For DIALTWIG to imitate ERIC's citation order, two reverse chronologies, one of ED numbers and one of EJ numbers, must appear in the source file.

Eight file building programs are used to create a database from a source file. The REWRITE program reformats DIALOG records in preparation for the automatic indexing. Because DIALTWIG operates only when the indexes are in capital letters, the LO2HI program transforms upper- and lower-case letters in the source file to all upper-case letters in the indexes. Through the use of the PARSE program,

IS DIALTWIG EFFECTIVE IN TEACHING ONLINE SEARCHING SKILLS?

by Marsha D. Broadway
and
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A pilot study of the effectiveness of DIALTWIG indicates that its use with graduate library and information science students can decrease significantly the number of format errors made in conducting bibliographic searches using DIALOG. Results also suggest that actual online search time can be reduced if students have prior experience using a DIALTWIG database.

PILOT STUDY

Twenty-eight students in a required information science course at Brigham Young University were given the Hermann Brain Dominance Test to determine if they were right-brained, left-brained, or bimodal. Students were then assigned to the experimental or control group based on stratifications of brain dominance and scores on course examinations.

Because both groups were part of the same class, instruction in online searching, command structure, and search strategies was identical for all students. Each student received the same written instructions on the use of commands. The instructor demonstrated a DIALOG search using a Datashow for the visual display. Both groups completed Assignment 1, which required written search strategies for high precision and high recall searches, and participated in a group review of the strategies.

Before the DIALOG search assignment was given, students in the experimental group were required to complete a DIALTWIG exercise that introduced them to the command structure and display formats. These students input a variety of commands in correct and incorrect formats, saw the results, identified the errors, and compared search statements. The DIALTWIG exercise was completed on a mini-ERIC database, which contained 78 downloaded **ERIC** records. Most students in the experimental group then used the mini-ERIC database to perform one or both searches for which they had written strategies in Assignment 1.

After the experimental group finished the DIALTWIG practice, both groups completed Assignment 2, which consisted of a written strategy for a high precision search, and performing the search online using DIALOG's ERIC database.

EFFECTS OF DIALTWIG USE

Printouts of the DIALOG searches were analyzed to determine the search time and the number of format errors for eleven search functions including the EXPAND, SELECT, SELECT STEPS, TYPE, and DISPLAY SETS commands, and the use of Boolean operators, prefix and suffix codes, word proximity, and nesting. The average search time of the DIALTWIG group was 21.32 minutes compared to 28.25 minutes for the control group. Although the average search time of the experimental group was approximately seven minutes less than the control group, the difference was not statistically significant at the .05 level ($t = 1.11$, $df = 26$, $p = 0.278$). The mean number of the format errors for the DIALTWIG group was 4.07, with a standard deviation of 3.91, and for the control group, 8.85, with a standard deviation of 6.84. Using the separate variance estimate, the difference in the format errors for the two groups was significant, ($t = 2.27$, $df = 20.67$, $p < 0.05$).

DIALTWIG has the potential of offering novice searchers microcomputer-based hands-on search experience that is transferable to the online bibliographic retrieval system. Based on this test study and other experience, use of DIALTWIG prior to searching the databases on DIALOG can decrease format errors and may reduce search time.

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the words in the data records are parsed and accession numbers and offset codes are assigned to terms or bound phrases in the main and alternative indexes. FILESORT then alphabetizes the terms and phrases in the main and alternative indexes. The RANK program eliminates from the alphabetical listings the multiple occurrences of a term or phrase and gathers all the location codes for the term or phrase into one entry. Machine-language coded main and alternative indexes and an accession number index are created with the BUILDIX program. The SPLITFIL program divides the data file into smaller files for ease in displaying search results. The SETUP program defines the display formats, describes the field codes, identifies the location of the index files, and establishes a password.

In their initial experiences, graduate library and information science students spend an average of 46.5 minutes in reading the instruction manual and building a database from a prepared source file of 14 downloaded ERIC records. One DIALTWIG user completed a database from a 500 KB source file in approximately four hours. Familiarity with the programs obviously increases efficiency in their use.

SEARCHING A DIALTWIG DATABASE

DIALTWIG's command structure and display formats closely follow those of DIALOG Version 2. Some of the more complex DIALOG search statements are not currently available. Figure 1 summarizes the command statements that are available, and those which have not been implemented. The abbreviated forms of the commands used in DIALOG searching can also be used with DIALTWIG. With the **SELECT** and **SELECT STEPS** commands, the searcher can use Boolean operators, prefix and suffix codes, open truncation, word proximity, and nesting. One cannot search only on major descriptors. The REWRITE program automatically strips the asterisks from the descriptor so they do not appear in the index, but are retained in the record. Internal and restricted truncations cannot be performed. Because DIALTWIG is microcomputer-based, word proximity with previously selected sets is not possible. Certain combinations will not work, such as prefix or suffix codes applied to a nested search statement. There are no online thesauri; therefore the **EXPAND** command can be used only to see a listing of alphabetically related terms. No **LIMIT**, **SORT**, or **SAVE** commands are available.

A single search statement may not exceed three lines or 240 characters. After a **BEGIN** command, a maximum of 40 sets may be created. The 41st set will kick the searcher out of DIALTWIG, and she or he must start over. ►

Error messages are provided for most syntax errors. If a **TYPE** command requests a display format that is not defined, no error message is given but a prompt will appear. In the case of a **SELECT S#** command that does not contain a Boolean operator or a range of set numbers (an inefficient command statement), the system will not generate a new set number, as does DIALOG, but will respond with a prompt.

Response time to search statements is impressive. The system will usually respond to **SELECT**, **EXPAND**, and **COMBINE** commands in one second; a five-term word proximity search may take five seconds.

TEACHING ONLINE SEARCHING SKILLS

Although the experienced searcher may be frustrated because some commands are not available with DIALTWIG, the system is sufficiently sophisticated to provide the novice searcher with useful learning experiences. Graduate students in my reference course complete three assignments using a DIALTWIG mini-ERIC base of 78 downloaded records. The first assignment acquaints the searcher with inputting commands and viewing the results. It also allows the student to see what occurs when commands are formatted incorrectly. The second assignment is a high precision search, and the third is a high recall search.

As the instructor, I have greater control over the mini-ERIC database than I have over the online ERIC database. I performed the initial ERIC search that produced the database, know what records are in the mini-ERIC, and can determine more precisely if students' search results are appropriate.

The advantages of the DIALTWIG database over the online ERIC database for the novice searcher relate primarily to size, time, and transferability of learning. The mini-ERIC database does not produce an overwhelming number of postings for any search statement. The searcher does not have to deal with narrowing thousands of records on her or his first search. Searchers can concentrate on mastering basic commands and becoming familiar with format rather than panicking over how to reduce the postings. Students are under no pressure to complete the assignments within a certain time limit. They may take all the time they need to analyze the system's responses, identify and correct errors, and refine their search techniques. Students have commented that the DIALTWIG display is very similar to the DIALOG display. A printout of a brief DIALTWIG search is provided in Figure 2. Students have also noted that they were able to apply the basic search techniques that they had learned using DIALTWIG to DIALOG searches.

Although library science students are likely to be less cyberphobic than they were five years ago, many are obsessed with submitting perfect assignments. In the case of online searching assignments, this obsession has proven to be expensive.

Although library science students are likely to be less cyberphobic than they were five years ago, many are obsessed with submitting perfect assignments. In the case of online searching assignments, this obsession has proven to be expensive. With a DIALTWIG database, the student may repeat the search, try as many variations as she or he chooses, and remove every typographical error without the library school incurring additional online costs.

WHY USE DIALTWIG?

In teaching online searching skills, DIALTWIG, which costs $340 for one copy or $850 for a site license, is an inexpensive tool. Students can be self-paced in learning search techniques because online and telecommunication charges are eliminated. In library schools, DIALTWIG can provide students with more search time and increased familiarity and skills. As online searching is added to more state curricula for high schools, DIALTWIG appears to be a useful option for high school library media centers that do not have online services available for students.

For those interested in creating personal or in-house databases, a database management program will do the job. The advantage of using DIALTWIG is that it provides a format and command structure that is familiar to most online searchers.

DIALTWIG is a usable and useful program; the database builder may need to have questions answered by Keith Stirling, and must write the instructions for teaching online searching. The search limitations are minor problems and do not prevent the novice searcher from learning much about online searching, or the experienced searcher from constructing productive searches. DIALTWIG has provided me with an online searching tutor that has enhanced my students' learning experiences and skills. As preparations for a new semester begin, my agenda includes creating another DIALTWIG database for use in the basic reference course.

DIALTWIG Version 2.1
PRODUCT DESCRIPTION

Applications:	Building in-house or personal databases Teaching online searching skills to novice searchers Teaching database building
Standard Features:	Simulates DIALOG command structure (some exceptions); creates databases from original records or data records downloaded from nine DIALOG databases; includes three databases that relate to library and information science.
Special Feature:	Online tutorial explains commands
Hardware Requirements:	IBM PC, XT, AT or compatibles Two disk drives or hard disk Monitor Printer
	Operating System: DOS 2.0, or greater
	Memory Requirements: minimum of 256K
Software:	Seven disks, including file building programs and three databases
Source Language:	IBM Pascal 2.0
Documentation:	Instruction manual for database building
Prices:	1 copy $340.00 2 copies 272.00 3 copies 238.00 4 copies 204.00 5 or more 180.00
	Site License—$850; allows copies equal to the number of compatible microcomputers owned.
	Three databases without the file building programs—$190.
Updates:	Convert Version 2.0 to 2.1, three disks—$30.
Producer:	Keith H. Stirling School of Library and Information Science Brigham Young University 5042 HBLL Provo, Utah 84602
Telephone:	Ordering Information and Support: 801/378-2976
Copyrighted:	Yes

FIGURE 1
DIALTWIG Command Statements

Implemented	Not Implemented
BEGINn	
SELECT TERM	**S TERM1; S TERM2; S TERM3**
S TRUNCAT? (open truncation)	**S TRUN?ATE** (no internal truncation)
	S LENGT? ? (no restricted truncation)
S TERM/AB (suffix codes)	**S TERM/MAJ** (no major descriptors)
S PY=1987 (prefix codes)	
S TERM1 AND TERM2 (Boolean operators)	
S (A AND (B OR C)) NOT D (nesting)	
S TERM1/TI AND TERM2/AB	
S WORD(W)PROXIMITY (**W, N, F, C**, etc.)	**S (TERM1 OR TERM2)/AB** (no codes with parentheses)
S TRUNCA?(W)PROXIM?	
S E5-E10	**S S3(F)S6** (no word proximity with set numbers)
SELECT STEPS (same variations as **SELECT** command)	

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FIGURE 1 (continued)

Implemented	Not Implemented
EXPAND TERM (alphabetically related)	**E (TERM)** (no subject-related)
E AU=SURNAME, A.	**E E8**
COMBINE 1 OR 2	
C 1-4/AND	
DISPLAY SETS	
TYPE 1/2/3-6	**DISPLAY**
	PRINT
LOGOFF	**LIMIT, LIMITALL**
?EXPLAIN (online tutorial)	**.COST, .SORT, .FILE**
?FIELDn	**SAVE, SAVE TEMP, RECALL, EXECUTE**
?FILES	

FIGURE 2
DIALTWIG SEARCH

```
File 1:ERIC
      Set     Items   Description
? SS (VISUAL IMPAIRMENTS OR BLIND) AND LIBRARY EQUIPMENT/DE
      S1        14    VISUAL IMPAIRMENTS
      S2        13    BLIND
      S3        12    LIBRARY EQUIPMENT/DE
      S4         5    (VISUAL IMPAIRMENTS OR BLIND) AND LIBRARY EQUIPMENT/DE
? T 4/6/1-2
 4/6/1
EJ307164  IR513397
  Technology for the Handicapped: Selection and Evaluation of Aids and Devices for the Visually Impaired.

 4/6/2
ED240756  EC161819
  Library Needs and Uses by Disabled Students at the Florida State University: A Survey.

? SS (S4 AND (COLLEGE LIBRAR? OR ACADEMIC LIBRAR?)) NOT FLORIDA
      S5        6    COLLEGE LIBRAR?
      S6        3    ACADEMIC LIBRAR?
      S7        2    FLORIDA
      S8        1    (S4 AND (COLLEGE LIBRAR? OR ACADEMIC LIBRAR?)) NOT FLORIDA
? T 8/2
 8/2/1
ED126882  IR003795
  Libraries for College Students with Handicaps; A Directory of Academic Library Resources and Services in Ohio.
  Ohio State Library, Columbus.
  1976
  35p.
  Sponsoring Agency: Bureau of Libraries and Educational Technology
(DHEW/OE), Washington, D.C.
  EDRS Price - MF01/PC02 Plus Postage.
  Language: ENGLISH
  Document Type: BIBLIOGRAPHY (131)
  Journal Announcement: RIEDEC76
  Descriptors: *College Libraries; *Handicapped Students; Hearing Impairments; Higher Education; Library Equipment; Library Facilities; Library
Materials; Library Services; Mobility Aids; Physical Disabilities; Visual Impairments
  Identifiers: *Ohio

? LOGOFF

A>REM Please remove both disks and return them to the secretary.

A>
A>
```

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DISTRIBUTING AN ONLINE CATALOG ON CDROM . . . THE UNIVERSITY OF ILLINOIS EXPERIENCE

by Paula D. Watson
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Urbana-Champaign
and
Gary A. Golden
Director, Camden Library, Rutgers,
the State University of New Jersey

INTRODUCTION

In Spring, 1985, the University of Illinois Library at Urbana-Champaign received a grant of more than $83,000 in Library Services and Construction Act funds through the Illinois State Library to create and distribute its online catalog in optical disk format. The primary object of the grant is to determine whether optical disk technology, and industry production facilities and services have advanced sufficiently to make it feasible to produce a database of more than 900,000 bibliographic records on laserdisk which could be distributed to small libraries and searched using a microcomputer. The University of Illinois had received an LSCA grant in 1980 to mount the software of the Western Library Network (WLN) to demonstrate how that software could be used as the basis for a statewide online union catalog for Illinois libraries. The result of that grant was the creation of a joint online catalog of the holdings of the University of Illinois Library and those of the River Bend Library System (one of the state's eighteen regional library systems). This joint online catalog, which became operational in the summer of 1984, serves as the prototype for a statewide online union catalog. Additional funding has since been obtained to expand the catalog into a union catalog by including the holdings of all libraries participating in ILLINET, the state's library resource sharing network.

The projected statewide database will contain 3,000,000 titles reflecting over 10,000,000 holdings and would be accessible at locations throughout the state and through dial-up access. The Illinet Online Union Catalog will provide, like the existing joint UIUC/Riverbend online catalog, sophisticated access to bibliographic information, including subject, keyword and Boolean searching as well as the ability to limit searches, for example, by library or by geographic region. The project described in this article was designed to test the feasibility of distributing the statewide union catalog database on optical disk. The distribution would be to libraries which did not want or could not afford online access through the

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mainframe system or which would not be satisfied with dial-up access. The database to be created and distributed in optical format is the University of Illinois portion of the prototype statewide database. According to the original grant plan, the database was to be searchable by keyword anywhere in the bibliographic record, or at least where keyword searching is possible in the present online system. This requirement necessitated high capacity storage to accommodate indexes and bibliographic data and the use of a full-text search software.

When the grant proposal was written, the state of optical technology pointed to the creation of the database on 12-inch videodisk. As work proceeded, however, trends in the industry convinced us that CDROM would be a more appropriate medium. What follows describes the background of this project, our experience working with two companies in the optical information business and our plans for evaluating the system once it has been created. As of this writing, tapes of the University of Illinois' online catalog records have been sent to the Brodart Company for production in optical disk format using their Le Pac system. A subsequent article will report on the overall success of the project: whether it could be completed in the time frame projected; and, whether the CDROM system created appears to serve as a good means for distributing union catalog information in a large and complex database to smaller libraries.

BACKGROUND

Relationship of the Project to Library Development in Illinois

Resource sharing and library cooperation have historically had a high priority in Illinois. The Illinois Library and Information Network (ILLINET) has been in existence in some form since 1965. It consists of about 2300 academic, public, special, and school libraries whose cooperative efforts are coordinated by the Illinois State Library through eighteen regional library systems, four Research and Reference Centers, and two Special Information Centers. Automation plays a key role in enabling libraries of all sizes and types to share their resources and to make materials at all libraries available to all citizens. Experimentation with the distribution of the projected online union catalog database in optical disk format is wholly in keeping with the direction of library development and cooperation in Illinois. The long range plan calls for the expanded use of technology in Illinois libraries and for the development of appropriate linkages between the system, network, and local libraries. Specific goals in the long range plan to which the Illinois optical disk catalog project relates include: expanding interlibrary cooperation, assessing means for making data communications between libraries more cost effective, expanding the use of the statewide database, and promoting personal computer access by citizens to library bibliographic databases. In funding projects for the increased use of technology, State granting agencies also take into account the recommendations of a May 1983 conference of Illinois public library leadership. Recommendations from this conference which were relevant to the funding of the optical disk catalog project include: providing direct off-site access using appropriate technology to the information resources of the public library and coordinating collection development between all libraries to ensure that user needs are met.

Experimentation with the distribution of the projected online union catalog database in optical disk format is wholly in keeping with the direction of library development and cooperation in Illinois.

The project we now envision, using the Brodart Le Pac CDROM based local public access catalog system, will allow us to experiment with the latest technology for storage, retrieval, and distribution of large amounts of bibliographic data. Were the pilot project to be entirely successful, it might lead in the future to the distribution of the statewide union catalog so as to make the library resources of the state directly available to every citizen.

DEALING WITH SERVICE PROVIDERS IN A VOLATILE, HIGH TECHNOLOGY INDUSTRY

LaserData

The original grant proposal named LaserData of Cambridge, Massachusetts as the system integrator for the project. In July of 1985 there were few companies which had any reasonable track record of creating optical information products for the library market. LaserData had worked with the Information Access Company to create InfoTrac, a 12-inch videodisk system which indexes 1,000 general interest periodicals. LaserData preprocessed the InfoTrac database, supervised the mastering process, provided hardware essential to the system, and worked closely with IAC to develop a multiuser workstation. InfoTrac was, in July of 1985, and is still the most successful

information retrieval product designed for reference use in libraries. Our original plan was to place the University of Illinois online catalog on 12-inch disk using the same hardware configuration as is used in the InfoTrac system.

LaserData also participated in the development of an information retrieval system on videodisk for the National Agriculture Library.[1] The goal of this project was to experiment with the feasibility of using laserdisks in conjunction with microcomputers for the storage and dissemination of agriculturally related full-text databases, including graphics. The initial effort involved putting the *Pork Industry Handbook*, a source containing illustrations as well as text, on a videodisk. At the time NAL initiated their project, the 12-inch videodisk was the natural choice of medium and LaserData was, similarly, the logical choice company to work with in developing the system. The disk containing the *Port Industry Handbook* also includes a selection of bibliographic citations from the **AGRICOLA** database. LaserData is now involved with NAL on a second project to put thirteen full-text USDA sources on a videodisk in the near future. The hardware for the NAL laserdisk system includes an IBM XT with 512 kilobytes of memory, a Pioneer LD-V1000 videodisk player, a LaserData TRIO 110 controller with an interface card, and a Panasonic TR 124 monochrome video display monitor for graphics. The software for the system is BRS/SEARCH modified by LaserData to allow access to graphics. LaserData also played a key role in developing the NAL system by providing the interface controller that connects a standard videodisk player to the personal computer allowing the retrieval of the multimedia information stored on the videodisk. The unit controls the videodisk player, retrieves the analog information from the disk, and recreates the digitally encoded material. Premastering of the first NAL database and indexing was done by LaserData using its proprietary encoding techniques. LaserData took essential responsibility for integrating the system.

As originally conceived, the Illinois optical disk catalog was to be on a 12-inch videodisk searchable through software mounted on an IBM PC AT with a hardware configuration similar to the NAL system and also employing the LaserData videodisk controller. LaserData was to preprocess the data and to integrate the system. As in the National Agriculture Library laserdisk projects, the search software was to be BRS/SEARCH which must run on PCIX, a UNIX based operating system. Illinois wanted the power, flexibility, and sophistication of BRS/SEARCH retrieval, but we did have reser-

FIGURE 1

Above is the first screen of the UIUC Le Pac CDROM-based catalog. Users have the option of conducting a search in the novice mode by title, author, or subject or of moving directly into a full keyboard search using the expert mode.

FIGURE 2

Proceeding through the simple menu, the user can narrow a subject search to books on "wood-carving" by Step IV of the search process.

FIGURE 3

In Step V, the Library's recently added holdings on "wood-carving" are displayed. The user is free to make a selection which displays full bibliographic information on that selection.

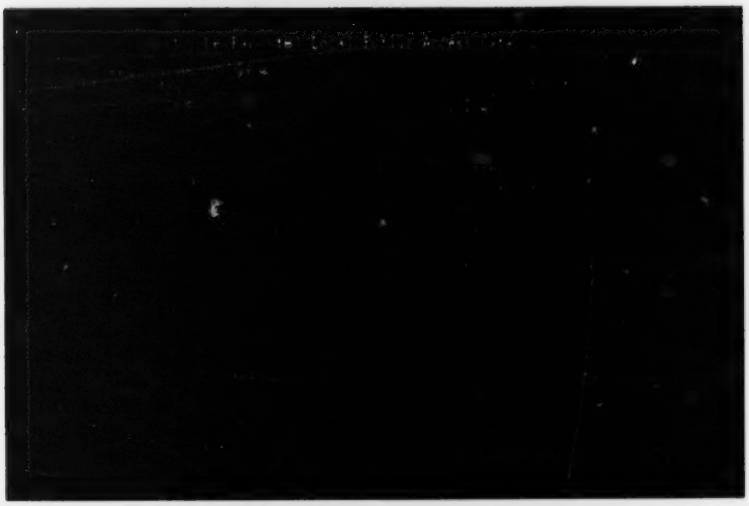

FIGURE 4

Full bibliographic information on the user's chosen book on wood-carving appears on the screen as illustrated above. Since call numbers are not part of the UIUC online catalog database, the standard Le Pac screen directions had to be modified so as to instruct the user to ask a librarian how to go about obtaining the volume.

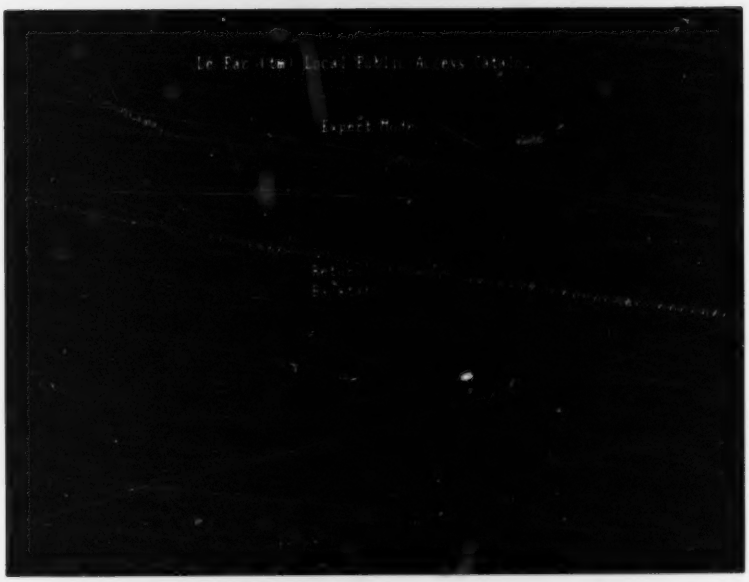

FIGURE 5

The search in the expert mode illustrated above will retrieve full bibliographic information on any book which has the words "optical," "information," and "technology" occurring anywhere in its record.

vations about relying on PCIX as the operating system for a public access catalog system to be used in small libraries. These reservations stemmed in part from reports of the inherent complexity of PCIX and its documentation. Also, we thought librarians working with the system would be far less likely to be familiar and comfortable working with PCIX, since MS DOS is the standard personal computer operating system. During July 1985, conversations with LaserData focused on this concern. LaserData advised us that they were investigating the feasibility either of developing an MS DOS-based full-text search software or of obtaining such software to be used on the proposed project.

The software question was to have been resolved by the end of summer 1985. Summer dragged into fall without communication from LaserData that a full-text MS DOS-based software had been identified. Meanwhile, conversations with personnel at NAL confirmed that PCIX presented some real problems for end-users and librarians. Librarians working on the project reported that it was difficult to learn the subtleties of PCIX. System crashes could occur due to improper shutdown procedures, power failures, too rapid advancement of video screens, and for other reasons. Rebuilding the system requires expertise and, usually, the intervention of a trained librarian. Response time on the bibliographic portion of the database was slow.

It was not until the end of October that LaserData reported to Illinois that they were no longer interested in identifying or developing an MS DOS-based search software. Although it was never made entirely clear, it seems likely that between spring of 1985, when initial (unwritten) agreements were made with LaserData and October of 1985, the company's interests and direction had changed. There had been important changes in top management personnel and we were also no longer working with our original technical contact.

The initial understanding was that LaserData was to produce a total system package and that, for the price agreed upon ($26,000), their services would include preprocessing and mastering of a sizeable portion of Illinois' approximately 900,000 record database, if not the whole database. Two videodisk players were to be employed, if necessary, and it was estimated that the whole database, with indexes, would take 1.2 gigabytes of storage. By October, LaserData had decided that it was prepared to preprocess and master a database of only 10 megabytes including indexes, i.e., a very small segment of the total database. Also, if Illinois wanted a MS DOS-based search software, it was made clear that we would have to shop for it ourselves. LaserData provided leads to sources, but putting the pieces of an MS DOS-based system together was to be largely Illinois' responsibility. At that point, personnel at Illinois had neither the time nor the skills to take on such an entrepreneurial role.

It is of course only possible to speculate concerning LaserData's loss of interest in the project. The company continues to work with both IAC and the National Agriculture Library on projects it had undertaken before it had made any commitments to the University of Illinois. Both projects involve the use of its proprietary hardware and encoding techniques on a potentially large-scale and presumably continuing basis. Such a long-term benefit could not be foreseen in the Illinois case. Also, LaserData appears not only to be interested in the marketing of its hardware, but also in the general field of image processing in the videodisk environment. Perhaps the processing of bibliographic data ceased to be a central interest of the company and they could not see their way clear to taking on a one-shot demonstration project which would have involved them in development or integration of a search software which was not already at their disposal.

Brodart

With LaserData's change of heart, we found ourselves three months into the grant year with a large database to put on optical disk and the concept for a system, but without a system integrator. Consultation with individuals in the industry led us to Brodart. A well established and broadly based library products company, Brodart had begun to market a CDROM based local public access catalog called Le Pac in July of 1985.[2] The system is targeted largely for the public library market. It may be searched either in novice or expert mode. (See Figure 6 for brief system specifications.) In novice mode, the user may search either by author, title, or subject using a specially designed ten key pad and proceeding through a very simple menu. Segments of the menu appear on each screen to help the user narrow the search to progressively smaller sections in an alphabetic hierarchy and finally, to the desired individual item or items. The total number of phrases viewed by the user in each pass is dependent on the total number of titles in the catalog. The lists of phrases run continuously through the alphabet and are selected so that they are spaced evenly throughout the title, author, or subject parts of the database. Brodart claims that viewing of the entire list can be accomplished in less than ten seconds. With authors and subjects, authority control can be provided.

The accompanying photographs illustrate

how the user progresses through a subject search in the novice mode. Figure 1 shows the first screen on the Illinois database for a search in the novice mode. Figure 2 shows the fourth step browsing alphabetic lists of subjects which allows the user to select books on "woodcarving." Step V in the search process (Figure 3) displays the Library's recent holdings on the subject. The user can now obtain more complete bibliographic information on a book which looks promising by selecting a title from this list. The complete display for the chosen book is shown in Figure 4. Figure 5 shows searching in the expert mode.

The software for the system is under continual refinement. At this writing, the expert system (which can only be employed with the option of a standard IBM keyboard) allows keyword searching of authors, titles, and subjects out of context along with Boolean combinations. It also provides a search key called "anyword" which allows searching for a known term anywhere in the record and also permits a search by Library of Congress card number and International Standard Book Number. The expert system is not menu-driven. Well-designed and succinct user aids will have to be provided if this segment of the system is to be given a fair test.

PREPRODUCTION WORK WITH BRODART

As we worked with Brodart, we came to realize the advantages of dealing with a library company with a longstanding interest in catalog development. Also, Brodart had an actual system under production and considerable experience in the marketplace. Prior to its experimentation with a CDROM based catalog, Brodart had developed and marketed a COM catalog and a mainframe based online public access catalog. When Brodart's Vice President John Schaub wrote his article for *Library Hi Tech* in 1985, the company's online public access catalog system had been installed in fourteen libraries. As of this writing, Le Pac is in use in more than twenty public and junior college libraries and library systems. The infrastructure for marketing, pricing, and technical support already existed within the company.

As of this writing, Le Pac is in use in more than twenty public and junior college libraries and library systems.

Once we had learned in a general way about Le Pac's capabilities, we scheduled a meeting with Brodart representatives at the ALA Midwinter meeting in Chicago. We were able to discuss the goals of our particular project, try Le Pac out ourselves, and arrive at a price for producing the database. Again Brodart's experience in marketing other kinds of catalogs and its well-defined market goals for Le Pac have allowed the company to develop clear pricing arrangements. Should there be deviations from these norms, the company is obviously aware of the tradeoffs involving visibility for the product and other considerations. Brodart agreed to preprocess and to master as much of the database and indexes as could be fit onto a single CDROM disk for $30,000. This allowed us to stay within the funding limits of the original grant and still fulfill its essential goals.

During the first week in April 1986 we received a Le Pac unit and sample disks to test. We were able to suggest changes to the screens so that the menu would make more sense to Illinois users. There were certain things we did not understand about the system. Our questions were answered immediately by telephone.

During late spring, the UIUC online catalog database was unloaded from the mainframe to eight 6250 bpi tapes. Technical considerations made it easier to unload only University of Illinois records without the records of the River Bend Library System, the other contributor to the joint catalog. The number of bibliographic records to be converted to optical disk format is thus only about 850,000 records and should include items catalogued for the University of Illinois Library after 1975 and before May 8, 1986. The tapes were shipped to Brodart in late June. In mid-July we received a set of formal specifications for the content of the database, indexing, and display of records. At our request, we had also received a list of standard index points (MARC tags and subfields). We took the opportunity to study this list and to recommend deletions and additions. As it turned out, the deletions and additions had already been anticipated by Brodart in their continuing efforts to improve access through the search software.

THE PRESENT PROJECT PLAN

Uncertainties

The largest database thus far mastered by Brodart consists of 400,000 records. The Illinois database is potentially more than twice that size. Because it is the catalog of a research library, many records may be longer and more complex than are found in a typical public library catalog. Brodart expects to master and index the Illinois database according to its standard indexing mode. It is unlikely that there will be room on a single disk for the en-

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tire database and all the indexes. We may need to reduce the size of the database in order to obtain maximum access. For us, this would be preferable to limiting access in order to produce the whole database on one disk. It is not entirely clear how well the system will handle such a large amount of bibliographic information. For example, keyword searching in the expert mode may produce unmanageable datasets which may be tedious to narrow down to the precise need of the user. In fact, as was implied earlier in the brief description of the expert mode, clearly one of the major questions about the effectiveness of Le Pac, as a vehicle for the distribution of a large and complex catalog, revolves around how adequate the novice mode will be in meeting the needs of the average small public library user. If the users' needs are not adequately met by the user-friendly system, the success of the project will depend greatly on the development of good user aids and the enthusiastic support of reference librarians at the test sites. Their wholehearted participation will be necessary in order for users to locate the system within each library and to understand and exploit its full potential.

Testing and Evaluation

Le Pac comes as a packaged hardware and software configuration (see Figure 6), but Illinois wanted to experiment with combining off-the-shelf equipment so as to test the premise that the equipment used for the local public access catalog in small libraries could also be used for other purposes, including dial-up access to other bibliographic databases, word processing, as well as operation of other optical disk databases. We have purchased IBM XT computers with 512K memory, Hitachi 1502s CDROM drives, standard keyboards and standard IBM monitors to be used at the development sites, the University of Illinois Library at Urbana-Champaign and the Rolling Prairies Library system headquarters in Decatur, Illinois. Brodart will lend us several pre-configured systems to be tested at the other field sites: the Decatur Public Library, Lincoln Public Library in Decatur, Parkland College Learning Center in Champaign and Champaign Public Library and Information Center. (Parkland College is a junior college located in Champaign.) None of these libraries has direct online access to the University's automated system. It is expected that the test of the optical disk catalog at Parkland and at Champaign public will be especially fruitful. Users and librarians in these two libraries located in a university town should find it particularly convenient to have direct access through a standalone system to campus library holdings.

As of this writing, the final report of this project is due to the Illinois State Library on December 30, 1986 which leaves little time for evaluation and testing, particularly if the time-

We intend to have librarians evaluate the system not so much in comparison to the University of Illinois Online Catalog, but as a viable means for distributing this catalog. Interviews and questionnaires will be employed.

table should slip any further. We intend to have librarians evaluate the system not so much in comparison to the University of Illinois Online Catalog, but as a viable means for distributing this catalog. Interviews and questionnaires will be employed. Patron users will be queried as to their general satisfaction with the system, its effectiveness in the retrieval of information, features, and its perceived usefulness to them. A simple questionnaire will be used which will be, at least in part, an adaptation of the instrument used in the National Online Catalog Survey sponsored by the Council of Library Resources in 1982. The final report will also evaluate to some extent how well the system functions mechanically (for example, response time, error rate, machine reliability, etc.). We will also want to assess the feasibility of using the Brodart system to distribute the Illinois statewide online union catalog database to smaller libraries around the state. Other similar systems are under development, including a CDROM-based system in the process of being mounted by the Western Library Network. Since the Illinois' Online Catalog uses WLN software, this particular system must certainly be evaluated as an alternative to Brodart's, as must any others which have now become available. Also, as we work with the Illinois Le Pac optical disk catalog, we will want to consider how soon other affordable optical disk-based information products are likely to be available to small public libraries for use on the equipment employed in the test project.

The Illinois' Statewide Online Union Catalog will be structured so that the bibliographic record for each item is found only once in the database. To determine the availability of any given item in a particular library, the user must be linked to the various circulation systems now in use in the state: LCS (the University of Illinois Library Computer System which ties together the eighteen regional public library sys-

tem libraries as well as more than twenty-five academic and special libraries), CLSI, the Data Research Associates system, and Dataphase. Brodart has the capability to create these interfaces but the ways and means of doing so in a complex online network environment must be explored.

CONCLUSION

The grant the University of Illinois received for this project allows us to familiarize ourselves with a new technology for storage, retrieval, and distribution of large amounts of bibliographic data. The grant concept is in line with the state's goals to make all the resources of every library available to potentially every citizen. However, the ultimate implementation of the overall grant plan will depend on many factors which are not yet clear. Costs are obviously central to future planning. Advances in the technology may contribute to significant reductions in the cost of updates to the database. Such advances will be fueled by the optical information industry's ability to penetrate the information market, particularly in applications for business, but also in applications for libraries. Thus far progress seems to have been relatively slow, particularly in the library marketplace. However, more products are being developed continually and search software is becoming more sophisticated and more user-friendly.

Also, for the concept of resource sharing through existing networks and standalone optical disk systems to work, effective linkages between disparate online systems must be developed. Design of these links is beyond the scope of this grant, but still within state-of-the-art capabilities.

The story this article tells of one library's experimentation with an emerging technology is entwined with general developments in this volatile field. In the spring of 1985, when the University of Illinois requested funds to test the feasibility of placing its machine-readable bibliographic records on an optical disk, companies working systematically on library applications for the medium were few in number. Although IAC had been developing the concept for InfoTrac for sometime, they had only begun shipment of the product in March, 1985. Brodart did not demonstrate Le Pac at an American Library Association conference until summer 1985.

Illinois' first connections were made with a company on the leading edge of development in selected aspects of videodisk technology. Our interests were seemingly not a good match with the long-term business interests of that company. Good advice from the experts led us to a company whose experience and goals give them a natural reason to work on our project even though it may be a pilot that is never implemented on a large scale. Events have led us to change from a 12-inch videodisk format to CDROM. These events are probably not fortuitous, but rather indicative of larger optical information industry trends. At this writing, the CDROM information revolution appears still to hover on the verge of realization. If it actually takes place to the extent that its proponents predict, the experience gained on this project will stand Illinois in good stead in the future.

ACKNOWLEDGEMENTS

The work described in this article has been supported by LSCA grant #III-86-0485-30 from the Illinois State Library. The original grant proposal was written by William Gray Potter who was the Assistant Director of General Services for Automated Systems, Circulation, and Administration. When Professor Potter left the University of Illinois to become Associate University Librarian for Technical Services at Arizona State University, Paula Watson became principal investigator. Bill Potter has continued to provide helpful advice and consultation throughout the project and we are grateful to him for his comments on this manuscript. Special thanks are also due to Dick Carney of Information Access Company and Julie Schwerin of Infotech who helped to identify Brodart as a company to work with to fulfill the terms of the grant. We are also grateful to Catherine Salika and to Kent Wendler, Data Processing Analysts, Administrative Information Systems and Services, University of Illinois. Ms. Salika has provided continuing technical support and she and Mr. Wendler handled the preparation of the tapes to be used in the mastering process by Brodart. Arnold Wajenberg, who is Principal Cataloguer at the University of Illinois Library, advised on product specifications. Judy Zidar provided critical information on the development of optical disk-based systems at the National Agriculture Library. Russ Thompson, Senior Technical Specialist, Library Automation Division, has been our technical contact at Brodart.

FOOTNOTES

1. This project is described in detail in Pamela Q. J. Andre, "Evaluating Laser Videodisc Technology for the Dissemination of Agricultural Information." *Information Technology and Libraries* 4 (June, 1985), p. 139-149.
2. For a complete description of the Le Pac system see John A. Schaub, "CD-ROM for Public Access Catalogs," *Library Hi Tech* 11, (1985), p. 7-13. ►

FIGURE 6
SYSTEM PROFILE OF BRODART'S LE PAC CDROM-BASED LOCAL PUBLIC ACCESS CATALOG.

Capacity: The standard Le Pac unit stores up 1,000,000 formatted bibliographic records. With available options it can store up to 4,000,000 records.

Standard Hardware:
Hitachi model 2500 CDROM drive
IBM or compatible personal computer with 512K memory
CGS TTL video monitor with swivel base
Keyboard with ten specially engraved keys
System cover with key lock and security features.

Optional Hardware:
Parallel printer interface
Printer (ink jet, dot matrix, or thermal)
Serial communications interface
Internal or external modem
Floppy disk drives (three or fewer)
Additional CDROM drives (three or fewer)
5, 10, or 20 MB hard disk drive
Standard IBM format keyboard.

Software: The system control program consists of 43 modules written in Microsoft Pascal and Microsoft LOF6 Assembler.

Operating System:
MS DOS or PC DOS 2.0 or higher
One copy of BRODOS is supplied with each Le Pac viewing station.

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HOW TO SIMULATE AN ONLINE SEARCH

. . .A WAY TO COPE WITH MAINFRAME CRASHES, CARRIER DROPS AND OTHER ONLINE DEMO MISADVENTURES

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Libraries offering online search services often attempt to demonstrate online searching as part of library orientations, new employee training, or briefings for higher management – occasions when libraries want to look their best. Among the things that have gone wrong in these demonstrations are "all ports are busy" messages on every network, poor response time, system down, noisy telephone lines, and even last-minute room changes that put librarians and students in rooms with no telephone lines. The likelihood of such mishaps seems to increase geometrically with the size of the group and the number and importance of VIP's present.

Clearly, some alternative to a live performance is desirable, preferably one that actually looks like an online search. Text should appear on the screen a letter at a time, at a speed slow enough to be both readable and convincing. There should be pauses while the system works on search statements, and intervals when many lines are displayed one after another without hesitation. The system should wait for a response after a prompt; a response should appear on the screen at typing speed rather than communication speed (300 baud, as slow as it seems, is still 180 words per minute or better) and should appear only when the instructor giving the demonstration is ready for it.

This article presents a technique for writing simulations of online searching that meet all these criteria. Required are IBM PC's or OCLC M300's with either color or monochrome display adapters and BASIC or BASICA, or compatibles such as the Zenith Z-150 using GW-BASIC.

The programming of a search simulation begins with the capture to disk of an actual online search. Anything received as ASCII text can be used; this includes everything received from DIALOG, BRS, or other databanks, and any text received from computer bulletin boards via ASCII file transfer. However, a file that has lines longer than 80 characters, such as a tabular presentation of numeric data with a 132 character line length, may not display effectively.

This file must be edited with a text editor or word processor capable of producing pure ASCII files (e.g., PC-WRITE, WordStar in nondocument mode, Personal Editor, etc.) to ensure that prompts such as DIALOG's ? and responses entered from the keyboard (e.g., search statements) are on separate lines. It may also be necessary to delete any blank space at the head of the file and replace with carriage returns. ►

The edited file then becomes the input for TXT2DATA.BAS, a program which converts each line into a numbered DATA statement, and writes the result to an output file (Figure 1). The lines will be numbered consecutively in increments of one, beginning with line number 10001. This file will be included in the completed simulation.

The heart of the technique is the use of a library of several subroutines, consisting of:

- four delay loops of varying durations
- a routine to stop action until a key is pressed
- a routine to set up a screen display that simulates CROSSTALK XVI's reverse video status line at the bottom of the screen
- a routine that prints a character string on the screen one character at a time, at what appears to be about 300 baud
- a routine that prints a character string on the screen one character at a time at about 30-40 words per minute, simulating keyboard entry.

This library of subroutines can be stored on disk as a file, to be appended to output files created by TXT2DATA.BAS as simulation programs are put together.

Programming the simulation consists of joining the file of subroutines and the file of data statements, and then writing statements that call the subroutines to display each data statement on the screen, either at typing speed or at communication speed. (It is much easier to do this with a text editor or word processor such as those mentioned above, than with BASIC's editor.) The key to realism is choreographing the action so as to produce a realistic sense of timing. Familiarity with the rhythm of actual searches is essential.

The key to realism is choreographing the action so as to produce a realistic sense of timing. Familiarity with the rhythm of actual searches is essential.

A complete simulation of a DIALOG search of file 411 (**DIALINDEX**), DIALDEMO.BAS, is included as Figure 2, reproduced courtesy of DIALOG Information Services, Inc. Analyzing DIALDEMO.BAS, we can see how these techniques are used:

- lines 240–290 dimension an array of string variables **A$(LINENUM)** and assign the data statements to those variables, so that the first line of the search (the data in line 10001 in the program) becomes **A$(1)**; 10002 is **A$(2)**, etc.
- line 300 calls the subroutine that sets up the screen display
- lines 320–350 set up a loop that, for the first four statements in the search, calls the subroutine that prints the statement on the screen at communication speed, and issues a **PRINT** statement to advance the cursor to the next line. The effect is that the first four lines of the search will be displayed one after another. Most of the simulation consists of loops such as this.
- line 360 displays **A$(5)**, the prompt **Enter Service:**, and then calls the subroutine that stops action until a key is pressed. Several such pauses are included in the program to give the demonstrator an opportunity to discuss the action that is to come. Since no **PRINT** statement was issued, the cursor does not advance to the next line once action resumes.
- line 370 calls the subroutine that simulates keyboard entry to display **A$(6)**.
- lines 380–410 form a loop to print the 7th through 12th lines one after another at communication speed, advancing the cursor to the next line each time.
- lines 420–470 use BASIC's LOCATE command to reposition the cursor back to line 13 column 1 on the screen after each line is printed, producing the effect of overprinting to provide password security.
- line 620 prints **A$(70)**, the **?** prompt, without advancing the cursor to the next line and then calls the subroutine that stops action until a key is pressed.

Lines 630–920, are variations on these themes. Lines 670, 710, 750 and 790 introduce delays of various durations to simulate the brief pauses and hesitations experienced while DIALOG processes search statements. Line 930 clears the screen and exits BASIC, ending the program and returning the PC to the DOS prompt.

Database files are proprietary information, protected both by copyright and by the terms and conditions of use. DIALOG Information Services, for example, includes the terms and conditions of use on the bluesheets for its databases, and in February released "Database Supplier Terms and Conditions," a compendium of the terms of use of its databases. As this document states, if a user ". . . desires to use or copy database file output in contradiction of the applicable restriction, the prior written consent of the database supplier must be first obtained by the customer."

Few of the databases have identical terms and conditions of use, but many have restric-

tions that prohibit a use such as the one described here without prior consent. There is little reason to believe, however, that such consent would not be granted for a legitimate training effort. Users should familiarize themselves with the restrictions and terms of the databases they wish to use, and seek written consent in advance where applicable.

FIGURE 1

THE TXT2DATA.BAS PROGRAM

```
5     '   TXT2DATA.BAS
10    '   Converts an ASCII text file into line numbered data statements
11    '   ************************************************************************
12    '   *       Copyright 1986      Stephen F. Palincsar      418 E. Bellefonte Ave.    *
13    '   *       Alexandria VA 22301       (703) 548-1585      (202) 275-3947        *
14    '   ************************************************************************
15    CLS         ' Clear the screen
20    KEY OFF     ' Turn off the function key reminders
30    LINE INPUT "Enter name of input file (without quotes):       ";SEARCH$
32    '           Ask user for name of file to be processed
35    '           (the input file is the edited downloaded search)
38    '
40    PRINT: LINE INPUT "Enter name of output file (without quotes):       ";DAT$
42    '           Ask user for name to give new file, which will contain
45    '           the downloaded search processed into line-numbered data
47    '           statements, with search text in quotes
48    '
50    CLS
60    LOCATE 12,20,1
65    PRINT "FILE CONVERSION IN PROCESS -- PLEASE WAIT"       ' A message to let
68    '                                   the user know something useful is going on
70    OPEN SEARCH$ FOR INPUT AS #1        ' Open the input file
80    OPEN DAT$ FOR OUTPUT AS #2          ' Open the output file
90    LINENUM = 10001                     ' Begin numbering with line 10001
95    '
100   IF EOF(1) THEN 150  '  Are we at the end of the input file? If so,
105   '                        exit the loop, close both files and finish up.
110   LINE INPUT#1, A$    '  Assign the next line in input file to variable A$
120   PRINT#2, LINENUM,"DATA",CHR$(34)+A$+CHR$(34)  '  Print in output file
125   '  the current line number, the word DATA, a ", the line from the input
127   '  file, and another "
130   LINENUM = LINENUM + 1   '          Add 1 to the current line number
140   GOTO 100                '          Go back to start of the loop and do it again
145   '
150   CLOSE       ' Close all files
160   CLS
170   LOCATE 12,30,1
180   PRINT "CONVERSION COMPLETED"      '  Let the user know the job is done
190   END   '  Program is done. To return to DOS, add: 200 SYSTEM
```

FIGURE 2

A Complete Simulation of a DIALOG Search of File 411

Please note -- The text of all remarks begins with a single quote. Note that it appears on the screen as a reminder to the programmer but does not affect the operation of the program.

```
10    '  DIALDEMO.BAS A demonstration program to simulate DIALOG logon
20    '  and DIALINDEX search. Copyright 1986 by Stephen F. Palincsar.
30    '  File 411 search reproduced courtesy of DIALOG Information Services, Inc.
40    '
50    '  Variables:
60    '  A$ -- String variable to hold each line of search in an array.
70    '  LINENUM -- counter for number of line in search. 1st search line is
80    '  LINENUM = 1, and is represented as A$(1).
```

►

FIGURE 2 (continued)

```
90      ' DELAY--counter used in delay loops.
100     ' I--counter used in loops in printing subroutines.
110     ' Z--length of string. Used in printing subroutines.
120     ' CHARACTER$--variable to hold a single character.
130     '
140     ' Subroutines:
150     ' 3000  -- set up screen to simulate XTALK screen display
160     ' 3200  -- stop action until a key is pressed
170     ' 3300  -- short delay loop
180     ' 3400  -- longer delay loop
190     ' 3500  -- fairly long delay loop
200     ' 3600  -- very long delay loop
210     ' 4000  -- print a string at telecommunication speed
220     ' 5000  -- print a string at typing speed
230     '
240     DIM A$(125)                             'Dimension array--reserves memory for
250     '                                       data statements in lines 10001 to 10122
260     '
270     FOR LINENUM = 1 TO 122                  'Read each data statement (i.e., line in
280       READ A$ (LINENUM)                     'search) into a variable in array
290     NEXT LINENUM
300     GOSUB 3000                              'Set up screen display
310     GOSUB 3200                              'Wait for a keystroke to start
320     FOR LINENUM = 1 TO 4
330       GOSUB 4000                            'Prints first 4 data statements
340       PRINT                                 'simulating communication speed
350     NEXT LINENUM
360     LINENUM = 5 : GOSUB 4000 : GOSUB 3200       'Prints A$(5), then waits for a keystroke
370     LINENUM = 6 : GOSUB 5000 : PRINT            'Prints data statement 6 at typing speed
380     FOR LINENUM = 7 TO 12
390       GOSUB 4000                            'Prints data lines 7 to 12 at comm speed
400       PRINT                                 'moving cursor to next line
410     NEXT LINENUM
420     FOR LINENUM = 13 TO 15                  'Prints lines 13 to 15 on top of each other
430       LOCATE 13,1,1 : GOSUB 4000            'by locating cursor at line 13, column 1
440     NEXT LINENUM                            'each time.
450     LOCATE 13,1,1 : GOSUB 3200
460     GOSUB 3400                              'delay loop simulates password entry
470     LINENUM = 17: LOCATE 13,1,1 : GOSUB 4000 : PRINT
480     FOR LINENUM = 18 TO 45
490       GOSUB 4000
500       PRINT
510     NEXT LINENUM
520     LINENUM = 46 : GOSUB 4000 : GOSUB 3200
530     LINENUM = 47 : GOSUB 5000 : PRINT
540     FOR LINENUM = 48 TO 56
550       GOSUB 4000 : PRINT
560     NEXT LINENUM
570     LINENUM = 57 : GOSUB 4000 : GOSUB 3200
580     LINENUM = 58 : GOSUB 5000 : PRINT
590     FOR LINENUM = 59 TO 69
600       GOSUB 4000 : PRINT
610     NEXT LINENUM
620     LINENUM = 70 : GOSUB 4000 : GOSUB 3200
630     LINENUM = 71 : GOSUB 5000 : PRINT
640     FOR LINENUM = 72 TO 80
650       GOSUB 4000 : PRINT
660     NEXT LINENUM
670     LINENUM = 81 : GOSUB 3400 : GOSUB 4000 : PRINT
680     FOR LINENUM = 82 TO 86
690       GOSUB 4000 : PRINT
700     NEXT LINENUM
710     GOSUB 3400
720     FOR LINENUM = 87 TO 92
730       GOSUB 4000 : PRINT
740     NEXT LINENUM
750     GOSUB 3600
760     FOR LINENUM = 93 TO 97
770       GOSUB 4000 : PRINT
780     NEXT LINENUM
790     GOSUB 3400
800     FOR LINENUM = 98 TO 103
```

FIGURE 2 (continued)

```
810       GOSUB 4000 : PRINT
820     NEXT LINENUM
830     GOSUB 3300
840     FOR LINENUM = 104 TO 108
850       GOSUB 4000 : PRINT
860     NEXT LINENUM
870     LINENUM = 109 : GOSUB 4000 : GOSUB 3200
880     LINENUM = 110 : GOSUB 5000 : PRINT
890     FOR LINENUM = 111 TO 121
900       GOSUB 4000 : PRINT
910     NEXT LINENUM
920     LINENUM = 122 : GOSUB 4000 : GOSUB 3200
930     CLS : SYSTEM                                    ' return to DOS
940     '
3000    ' ********************************************************************************
3010    ' Set up screen display to simulate CROSSTALK XVI
3020    ' status line in inverse video on line 25
3030    '
3040    KEY OFF : CLS                                   'Clears screen & shuts display line off
3050    LOCATE 25,1,1 : COLOR 0,7                       'Next print is in inverse video
3055    '
3060    PRINT " Esc for Attention, Home to SWitch    | Capture Off    | Numeric ";
3065    '
3070    '                                               Text put on line 25 with a locate 25,1
3080    '                                               will not scroll off screen.
3090    LOCATE 1,1,1 : COLOR 7,0                        'Cursor to upper left, normal video
3100    RETURN
3110    '
3200    ' ********************************************************************************
3210    ' Stop action until a key is pressed
3220    '
3230    Z$ = INKEY$ : IF Z$ = "" THEN 3230
3240    RETURN
3250    '
3300    ' ********************************************************************************
3310    ' Short delay loop
3315    '
3320    FOR DELAY = 1 TO 350 : NEXT
3330    RETURN
3340    '
3400    ' ********************************************************************************
3410    ' Slightly longer delay loop
3415    '
3430    FOR DELAY = 1 TO 500 : NEXT
3435    RETURN
3440    '
3500    ' ********************************************************************************
3510    ' Fairly long delay loop
3520    '
3530    FOR DELAY = 1 TO 2500 : NEXT
3540    RETURN
3550    '
3600    ' ********************************************************************************
3610    ' Very long delay loop
3620    '
3630    FOR DELAY = 1 TO 10000 : NEXT
3640    RETURN
3650    '
4000    ' ********************************************************************************
4010    ' Print line a character at a time, simulating telecommunications.
4020    '                                                 Slows printing of line to what seems
4030    Z = LEN (A$(LINENUM))                           ' like 500 baud communications.
4040    FOR I = 1 TO Z
4050      CHARACTER$ = MID$(A$(LINENUM),I,1)
4060      PRINT CHARACTER$;
4070    NEXT I
4080    RETURN
4090    '
5000    ' ********************************************************************************
5010    ' Print line a character at a time at typing speed, simulating
5020    '                                               entry from the keyboard
5030    Z = LEN(A$(LINENUM))
5040    FOR I = 1 TO Z
```

►

FIGURE 2 (continued)

```
5050      CHARACTER$ = MID$(A$(LINENUM),I,1)
5060      PRINT CHARACTER$;
5070        FOR DELAY = 1 TO 120                ' Delay loop to slow to typing
5080        NEXT DELAY                          ' speed -- about 30 wpm
5090    NEXT I
5100    RETURN
5110    '
5120    ' ********************************************************************************
5130    ' DATA statements are added here, beginning with line 10001
10000   '
10001   DATA " "
10002   DATA " "
10003   DATA "Dialog Information Services' DIALNET"
10004   DATA "-2030:01-005-"
10005   DATA "Enter Service:"
10006   DATA "dialog2"
10007   DATA " "
10008   DATA " "
10009   DATA "DIALNET: call connected"
10010   DATA " "
10011   DATA "DIALOG INFORMATION SERVICES"
10012   DATA "PLEASE LOGON:"
10013   DATA " *********"
10014   DATA "?HHHHHHHHH"
10015   DATA "?SSSSSSSS"
10016   DATA " "
10017   DATA " *********"
10018   DATA " "
10019   DATA "Welcome to DIALOG"
10020   DATA " "
10021   DATA "Dialog version 2, level 6.8.10 "
10022   DATA "LOGON File006   04dec85   10:50:38 "
10023   DATA "DIALOG News (Enter ?NEWS for details): "
10024   DATA "******************************************************************************** "
10025   DATA "DIALMAIL Electronic mail is now available! See ?DIALMAIL. "
10026   DATA "******************************************************************************** "
10027   DATA "Now Available: "
10028   DATA "  ELECTRONIC YELLOW PAGES--SERVICES (Files 508, 509) "
10029   DATA "   reloaded "
10030   DATA " "
10031   DATA "Free time in December:  "
10032   DATA "  PTS NEW PRODUCTS ANNOUNCEMENTS (File 621)--up to "
10033   DATA "  a total of $33 in combined connect time and online "
10034   DATA "  TYPEs or DISPLAYs. "
10035   DATA " "
10036   DATA "Announcements: "
10037   DATA "  Price changes now in effect for: "
10038   DATA "  MANAGEMENT CONTENTS (File 75) and "
10039   DATA "  PTS MARS (File 570).  (See ?NEWS.)"
10040   DATA " "
10041   DATA "File   6:NTIS--84-85/ISS25"
10042   DATA "(Copr. NTIS)"
10043   DATA " "
10044   DATA "            Set     Items     Description"
10045   DATA "            --      ---       -----------"
10046   DATA "?"
10047   DATA "b 411"
10048   DATA " "
10049   DATA "              04dec85   10:51:10   User000000"
10050   DATA "         $0.28      0.006 Hrs File6"
10051   DATA "         $0.03   Dialnet"
10052   DATA "         $0.31   Estimated cost this file"
10053   DATA "     $0.31   Estimated total session cost   0.009 Hrs."
10054   DATA " "
10055   DATA "File 411:DIALINDEX"
10056   DATA "(Copr. DIALOG Inf.Ser.Inc.)"
10057   DATA "?"
10058   DATA "s files infosci"
10059   DATA " "
10060   DATA "File      1:   ERIC--66-85/NOV "
10061   DATA "File      6:   NTIS--84-85/ISS25 "
10062   DATA "File     12:   INSPEC--1969 thru 1976 "
10063   DATA "File     13:   INSPEC--77-85/ISS23 "
```

FIGURE 2 (continued)

```
10064   DATA "File   61:  LISA – 69-85 (8511) "
10065   DATA "File  202:  INFORMATION SCIENCE ABSTRACTS 66-85/MAY "
10066   DATA " "
10067   DATA "File         Items          Description "
10068   DATA "---          ---            ----------"
10069   DATA " "
10070   DATA "?"
10071   DATA "ss (simulat?) (5n) (search or searching)"
10072   DATA " "
10073   DATA "  "
10074   DATA "     1:  ERIC – 66-85/NOV"
10075   DATA "            8405  SIMULAT? "
10076   DATA "            6963  SEARCH "
10077   DATA "            1433  SEARCHING "
10078   DATA "              28  (SIMULAT?) (5N) (SEARCH OR SEARCHING) "
10079   DATA " "
10080   DATA "     6:  NTIS – 64-85/ISS25"
10081   DATA "           65660  SIMULAT? "
10082   DATA "           10911  SEARCH "
10083   DATA "            1740  SEARCHING "
10084   DATA "              84  (SIMULAT?) (5N) (SEARCH OR SEARCHING) "
10085   DATA " "
10086   DATA "    12:  INSPEC – 1969 thru 1976"
10087   DATA "           23546  SIMULAT? "
10088   DATA "            6585  SEARCH "
10089   DATA "            1064  SEARCHING "
10090   DATA "              52  (SIMULAT?) (5N) (SEARCH OR SEARCHING) "
10091   DATA " "
10092   DATA "    13:  INSPEC – 77-85/ISS23"
10093   DATA "           59761  SIMULAT? "
10094   DATA "           11751  SEARCH "
10095   DATA "            2584  SEARCHING "
10096   DATA "              80  (SIMULAT?) (5N) (SEARCH OR SEARCHING) "
10097   DATA " "
10098   DATA "    61:  LISA – 69-85 (8511)"
10099   DATA "             373  SIMULAT? "
10100   DATA "            2386  SEARCH "
10101   DATA "            4609  SEARCHING "
10102   DATA "              27  (SIMULAT?) (5N) (SEARCH OR SEARCHING)"
10103   DATA " "
10104   DATA "202:  INFORMATION SCIENCE ABSTRACTS 66-85/MAY"
10105   DATA "            2086  SIMULAT? "
10106   DATA "            6722  SEARCH "
10107   DATA "            3832  SEARCHING "
10108   DATA "              25  (SIMULAT?) (5N) (SEARCH OR SEARCHING) "
10109   DATA "?"
10110   DATA "logoff"
10111   DATA " "
10112   DATA "          04dec85 10:56:25 User000000"
10113   DATA "      $3.04    0.087 Hrs File411"
10114   DATA "      $0.52    Dialnet"
10115   DATA "      $3.56    Estimated cost this file"
10116   DATA "      $3.87    Estimated total session cost   0.096 Hrs."
10117   DATA "Logoff: level 6.8.10 10:56:29"
10118   DATA "  "
10119   DATA " "
10120   DATA "DIALNET: call cleared by request"
10121   DATA " "
10122   DATA "Enter Service:  "
```

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CDROM CATALOGS—EVALUATING LEPAC AND LOOKING AHEAD*

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INTRODUCTION

An article describing the first phase of the University of Illinois' project to put its online catalog database on CDROM appeared in the March, 1987 issue of *ONLINE*. The project was supported by an LSCA grant obtained through the Illinois State Library. Its purpose was to demonstrate the feasibility of converting a large bibliographic database to optical format and searching the database by means of a microcomputer. The University's database was used as a prototype, to ascertain whether it might be possible to distribute the state's online union catalog (which is now under development) on optical disk, to libraries within Illinois which might not want direct online access to the mainframe system.

After exploring the possibilities of transferring the database to twelve inch videodisk, we decided to use Brodart's LePac system which employs CDROM. In January of 1986, when this decision had to be made, Brodart was the only company with a CDROM-based public access catalog on the market. Our arrangement with the company was to master as much of our database as could be fit on one disk, and make it searchable using Brodart's standard indexing capabilities. The result was a disk holding 700,000 bibliographic records which could be searched in the LePac expert mode by author, title, subject (or any combination of these), by ISBN number and LC card number, and by any word in an indexed field. The software we had permitted some Boolean combinations.

The system received a generally quite favorable reception from the public and junior college library users who tested it. The article which follows describes the testing and evaluation of LePac and its potential use (or the use of a similar system) in the state of Illinois. [1]

EVALUATION

The system was tested at four major sites: three public libraries of 280,000, 220,000, and 40,000 volumes, respectively, and at a junior college library of 80,000 volumes. The regional public library system headquarters for two of the public libraries also participated. The issues examined included: ease of use or improvements needed to the technology, utility of the technology in relation to present methods of access, and, in general, its perceived value. [2]

The data collection instruments were designed expressly for this survey, although concepts and questions included in the *National Online Catalog Use* study were also used. Librarians at the various sites formed the heart of the evaluation, since it would be they who would make the ultimate decision concerning eventual acceptance of the optical disk-based Statewide Online Union Catalog. Data were also collected from users at the four major test sites, as well as at UIUC, by means of a concise reaction card concentrating on a few central questions. A class in the UIUC Graduate School of Library and Information Science was asked

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to evaluate the system by means of a detailed questionnaire focusing on software and retrieval capabilities. An expert was called upon to assist in determining indexes of perceived value. [3] Unfortunately, because the grant was originally meant to be only a year in duration and an extension was required, very little time was available for actual testing and evaluation.

Librarian reaction was captured during site visits by the evaluation team. After staff members had sufficient time to become acquainted with LePac, a group interview was scheduled at each library, which centered around the use of checklists and planned questioning to elicit opinions. The site chosen for the equipment at each library was considered crucial to its reception by users. Three libraries placed it in highly visible, high traffic locations close to library staff who could explain its capabilities. One located it in a carrel behind the reference desk where it remained largely invisible to users unless they were specifically referred to it. Enthusiasm for the project and the system were lowest among librarians at this site, and this was quite naturally reflected in user response.

THE CDROM CATALOG AND INTERLIBRARY LOAN

One of the stated aims of the grant project was to evaluate the likelihood that the availability of the ILLINET Online Union Catalog in optical format would enhance resource sharing in the state. Naturally only suggestive inferences can be drawn here, since the database made available was not that of the large, multitype library network, but rather that of one of the largest research libraries in the country. To evaluate whether the availability of a CDROM union catalog would enhance resource sharing requires the examination of exactly where and how such a system would fit into the array of cooperative mechanisms, and access to bibliographic utilities already available in a state in which networking has received priority attention for decades. The ILLINET system is a highly developed and efficient network upon which libraries of all sizes can rely for interlibrary loan service.

More than 25 libraries and the regional system network nodes in the state also have direct access to LCS, the statewide online circulation system. Many non-LCS libraries (three of the sites where the CDROM catalog was tested, for example) can easily search LCS through dial-up and routinely use it to identify material for loan. Larger libraries in the state may also have direct access to OCLC and may use it for verification purposes, even if they rely on the regional system library to obtain the item for them.

Smaller libraries in each region are under no obligation to fully identify or locate items their patrons wish to borrow. Responsibility for this may be borne entirely by the regional system library. Paul Johnson, of the Rolling Prairies Library System, estimates that approximately 80 percent of the interlibrary loan requests received by system headquarters are from public and school libraries, many of which are without even the most basic bibliographic tools. About 40 percent of loan requests come without any verification whatever. Although the test librarians implied that the need is not likely to be compelling, it was generally agreed that the smaller libraries, though least able to pay for it, had most to gain from access to a standalone system on CDROM which could be used to identify materials of interest to their users beyond their own collections. Librarians from small public libraries, who saw a demonstration of the system, were clearly concerned about costs, but they were also highly enthusiastic about the possibilities of radically expanded access for their users. Although the broad array of options for networking that already exist in Illinois for the larger libraries dampened enthusiasm for the creation of a CDROM-based online union catalog, various benefits were identified. For example, rising telecommunications costs might make it more appealing to resort to a standalone system than to dial-up to what may be a distant node in the LCS network or a bibliographic utility. Ease of access and response time were cited as frequent problems with OCLC.

In terms of workload, the test libraries saw little gain to themselves. All felt that, because of the large number of unverified requests received by the systems libraries, real work savings could be effected at that point in the interlibrary loan process.

As an index of perceived value, the contact librarians were asked to estimate how much use would justify purchase of the statewide union catalog on CDROM, and also, what cost they thought would be reasonable. Purchase was judged to be worthwhile if patron/staff usage were to be five searches per day (at three sites) or 15 to 20 searches per day (at one site). The site least enthusiastic about the project, surprisingly enough, would be willing to pay $2,000 annually, since their view was that the existence of such a tool would make it more or less essential to a well stocked collection. The other test libraries would be willing to pay $500 per year for the service.

DIRECT USER ACCESS

The LePac system, which is designed to be used as a public access catalog, is quite user- ►

friendly. However, two of the four test site libraries did not appear to value it highly as an end-user tool, nor was it heavily promoted for the purpose of users' gaining direct access to information about the holdings of a distant library with a very comprehensive collection. Librarians at one of these sites could see a CDROM catalog as valuable to researchers and business people in the community. At a second site, the staff saw the work of interlibrary loan being passed back to the patron, and displayed a definite resistance to direct charging on the part of users, were this to be a future possibility.

At the third public library, librarians encouraged public use by strategic and highly visible placement, and by frequent referrals of users to the system, with an explanation of its capabilities. This promotional effort resulted in a measurable increase in interlibrary loan during the test period—15 percent increase over the normal lending rate for a like time period.

At the junior college library, librarians also viewed the system as a means of broadening the information horizons of their users. The test produced an additional and valuable result, which was to greatly heighten interest at this particular library in a CDROM catalog as an alternative to the online system currently available to them. The use of their current system results from their participation in the regional network, but they do not find it satisfactory for their needs, do not use it even for circulation, and do not encourage its use by patrons as an online public access catalog. A CDROM catalog appears to offer a perfect solution. Total local control is possible, the system is cost effective, and elaborate technical expertise is not required to maintain it. For a library like this, with a collection of fewer than 100,000 volumes, CDROM catalogs can provide quite sophisticated search capabilities presented in an understandable way to users. CDROM catalogs also can have reasonable response times. While the administration of the most participant public library in the test was not prepared to consider the installation of a CDROM catalog, patrons expressed a high level of interest in such a possibility.

A CDROM catalog appears to offer a perfect solution. Total local control is possible, the system is cost effective, and elaborate technical expertise is not required to maintain it.

OPTICAL CATALOGS: SOME DIRECTIONS AND DEVELOPMENTS

Brodart has done pioneering development work on CDROM catalogs for libraries. The company started with simple search concepts and protocols and has continually refined these and the LePac product over the last two years. Recently, however, several other companies have entered the market with competing products. At the January 1987 ALA midwinter meeting, several optical public access catalogs were exhibited. These included: General Research Corporation's LaserGuide; the Intelligent Catalog from Bibliofile; and a write-once disk system, MARCIVE/PAC. Others have been advertised or are under development.

The new products have some interesting features. LaserGuide, for example, presents a full bibliographic display as the initial response to a query with multiple hits, and totes up the number of matches as it searches. Boolean searching is accomplished by entering terms in windows marked "all of these words," "one or more of these words," and "and will not contain these words." Some options offered, (like the library map which locates the user's selections on a floor plan) will work only for smaller libraries. MARCIVE/PAC, as a write-once system, allows addition of records on site. Among its several attractive features is the ability to generate a printed bibliography on the subject of interest, by allowing the user to flag preferred records as they appear on the screen. It also has particularly neat and clear displays.

MARCIVE/PAC is designed to function optimally for smaller libraries. At this writing, it has been used only for libraries with collections of 100,000 to 120,000 volumes. Write-once systems have limitations not found in CDROM systems, but still, successfully mounted large databases are more in the realm of research and development than they are in routine production.

There is a 600,000 database in regular use as part of the Access Pennsylvania project.

Here, 18 consortia consisting of high school, public, and small college and university libraries have access to a database of their combined holdings through Brodart's LePac. Some participants in the program have benefited most from having automated access to their own holdings for the first time. Others have gained advantages primarily through resource sharing. Though no formal evaluative studies appear to have been done as yet, satisfaction with the system is reported to be high. As this article is being written, Pennsylvania is awaiting a new, faster version of the search software, and an update of the existing database, which will bring its size to approximately 1.3 million records.

Perhaps an even more spectacular achievement than Pennsylvania's is the Western Library Network's (WLN) recent release (early 1987) of a 2,000,000 record database (LaserCat) to 100 libraries in the Pacific Northwest (See May *ONLINE* pages 135-138 for an in-depth discussion of LaserCat). The system consists of three disks which run on two drives. The first disk contains brief records and holdings; the second contains indexes, the remainder of the MARC records, various tables and help screens; and the third contains the older remainder of the MARC records. Most search queries are satisfied by use of disks one and two which are searched simultaneously by the software. Programmers have employed a number of quite sophisticated techniques to reduce the number of seeks that must take place in order to optimize response time, but project personnel still believe further improvements are necessary. So far, user reaction is positive.

Others will surely be watching what happens in Pennsylvania and Washington. Maine has announced plans for a statewide network on CDROM. Louisiana too is evidently thinking along similar lines. The market is definitely beginning to grow and show increasingly more urgent interest. Competition among providers should result in rapid improvements in access capabilities and customized features. Libraries or library systems with a CDROM catalog in their future plans would be wise to look carefully at what is now available, to follow product and technical developments attentively, and to keep in touch with their colleagues who have already made commitments.

—Paula D. Watson

EFFECTIVENESS OF LEPAC

In discussing the effectiveness of LePac as a system, it must of course be remembered that we were using the hardware and software available at a precise point in time. The product is still being refined and many of the problems we encountered had already been identified by Brodart as areas needing attention.

User response was definitely skewed to the positive side at three out of the four major test sites. Despite the fact that the database was limited to UIUC holdings added since 1976, 73 percent of patrons who filled out a reaction card, found what they were looking for.

Librarians' response to the novice mode was less positive than to the expert mode. Significant criticisms included the time required to arrive at a match, and the tedium of searching through long alphabetic displays. Sixty percent of users expressing a reaction went beyond the novice mode to the expert mode. Librarians generally found the term "expert" misleading, since the search mode is quite easy to use. Brodart has evidently received other feedback to this effect, since one enhancement contemplated is to offer LePac with or without the novice mode.

There was consensus on certain necessary improvements. One change noted as critical by librarians is the addition of an escape mechanism to exit from long searches. Not critical, but still cited, was the need for a mechanism for predicting the magnitude of search results. In the same category is the appearance of the message "more entries are available," when in fact no more are forthcoming.

We had a particular problem with foreign words containing diacritic marks. Most were essentially irretrievable due to programming and processing problems which had not yet been resolved when our disk was mastered. These difficulties were not unique to the UIUC project, and Brodart expected a solution in future releases.

User aids available were seen by librarians as inadequate. Perhaps because of the evolving nature of the system, Brodart seemed to have little interest in making significant improvements. It also appeared to be a matter of policy to avoid excessively technical documentation. Perhaps this point of view makes some sense with regard to users, but it is frustrating to librarians who have to discover fundamental features of the search software more or less by trial and error. For example, documentation provided does not explain that the system will only search a term which is three or more characters long. Thus librarians looking for titles on "Apple II" computers were mystified, as were those searching for series titles and

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numbers. The uses of the *anyword* field (searching for any word in an indexed field) are not adequately explained. Automatic truncation takes place, but is never mentioned. Librarians and users alike felt that LePac needs a sharper, more focused user manual, and a one-page "tip" sheet.

There were certainly some users who were quite dissatisfied with system response time, but most did not find this a significant problem. Perceptions here were obviously dependent on expectations and past experience with online systems. All sites used their currently available online system as a point of reference and found LePac performance acceptable in this context. Users at UIUC who tested the system, were comparing it with a sophisticated mainframe system, and their response was, predictably, quite different.

To provide some objective data on response time, we timed 87 sample searches at the UIUC library. The searches were based on actual inquiries at our Information Desk. Our first aim was to explore the amount of time needed for LePac to provide its first response to a query, whether this response was a complete answer, positive and leading onward towards a complete answer, or negative and ending the search without result. The time needed for initial response ranged from one second or less to several minutes if very common terms had to be searched. The average for all types of searches was 29.0 seconds. Far more informal experimentation at the junior college test site produced a quite similar result. For the sake of comparison, three to four seconds is considered an acceptable initial response time on a mainframe online catalog system. One of the sample searches turned out to be for a common one-word title and was abandoned by the searcher after 19 minutes. Such a search would cause problems on any system, but there were other queries involving common subject or title terms which required unacceptable intervals for an initial response. The absence of an escape mechanism and the persistence of the message "Please Wait" on the screen may have caused high frustration levels in some test site users. Naturally, a caveat must be introduced in relation to interpretation of the time test results, which is that any such tests are influenced by the exact hardware and software in use on the system at the moment, and also by the search strategy employed, the skill of the searcher, and the searcher's experience on the system.

• Brodart is clearly aware that searching in some instances can be slow. They hope soon to implement version 4.9 of the LePac software. Company representatives believe the optimization of the search logic in this version will make searching five times faster. Speed of response, however, is a well known limitation of CDROM technology, because of the high seek time required to locate data on the disks as they are presently packed. In Microsoft's recently issued book on the subject *CDROM. The New Papyrus*, Bill Zoellick quotes an average seek time of 500 milliseconds to one second. [4] Richard Boss and Judy McQueen writing somewhat earlier in a study for the Council on Library Resources quoted the same figure as a best-case measure, and also pointed out that : "Advocates of the technologies suggest that these speeds can be significantly improved by attention to the layout of the data on the disks and by development of specialized software. . .. [5] They also suggest possible improvements through faster sensors and circuits. In fact, Brodart reports that Hitachi has developed a drive containing a new chip which improves seek time. Without doubt, expectations regarding response time are crucial in relation to any consideration of placing very large databases on CDROM.

As to the reliability of LePac equipment and software, only one site had difficulty with the software. The problems were with the novice mode. Eventually a new disk had to be procured, but Brodart was efficient and helpful throughout. At various times at various sites, the software hung up in one way or another, but rebooting the system was always sufficient to restart.

Japanese manufacturers of CDROM drives claim 10,000 to 11,000 hours mean time between failures, based on their experience with audio drives. Our short term experience certainly put no dent in these claims.

The equipment was completely reliable. Japanese manufacturers of CDROM drives claim 10,000 to 11,000 hours mean time between failures, based on their experience with audio drives. Our short term experience certainly put no dent in these claims.

IMPLICATIONS FOR ILLINOIS

The 3,000,000-Record Database. Brodart assured us that it would be *just* feasible to fit a database of 3,000,000 records on four CDROM drives. Although there are claims from many

quarters that it is possible to work with higher numbers of drives, most companies now in the CDROM catalog business believe they can obtain reasonable results with a database on four drives. The ILLINET Online Union Catalog database would be at least 3,000,000, or possibly 4,000,000 records. There are ways to decrease the amount of data on the disk to obtain the maximum number of records, for example, by truncating the records or reducing the indexing available. Nevertheless, mastering the initial disk would be approaching what appears to be the limits of present, although perhaps not of *potential* development. The union catalog has been projected to grow at the rate of 15 percent each year, so that, even if successful results could be obtained with the initial database, updates would push the limits of present development even further. Cost and convenience are obvious issues. CDROM drives are shrinking in size and coming down in price, but current pricing would call for an expenditure of at least $2800 per site for the drives alone. Furthermore, suppliers have not had a great deal of experience with very large bibliographic databases.

First-hand searching experience, together with the time tests done on LePac as part of the project, engender some concern that response time on a 3,000,000 to 4,000,000 record database might be problematic.

The limits of the technology in terms of the trade-offs between storage capacity, sophistication of search capabilities, and response time, make it seem unlikely that Illinois should plan soon for a statewide union catalog on CDROM. Given the apparent rate of development in the optical information field, direct access for every citizen to information on a CDROM catalog about library materials all over the state of Illinois certainly is not out of the question. It does appear to be a little way down the road, however.

Other Options. There are other possibilities for the state to consider for the productive use of CDROM catalogs in the short term. It is expected, for example, that the statewide online union catalog will be phased in over a period of time. Not all potential participants will join at the outset. A CDROM catalog of initial union catalog holdings for the use of future participants might be a useful interim measure. Or perhaps, a CDROM catalog of non-participant holdings for the use of participants might also be considered. Regional subsets of either the participant or the non-participant databases are yet another possibility to which the technology lends itself particularly well. Although charging capability was not addressed in the present project at all, smaller CDROM catalogs could be interfaced with existing circulation systems to create fully-featured online catalogs.

Like the junior college library in our test, other libraries in the state which are presently without online access to their own holdings or are dissatisfied with systems currently or potentially available to them, might turn to the CDROM catalog as an ideal alternative.

Lastly, as has been the case in Pennsylvania and Minnesota, Illinois might consider extending automated public catalog access through a CDROM-based system to libraries, such as high school libraries, for which such access has not previously been considered.

This list of options is not in any way Illinois specific. Individual libraries, library systems, regional consortia, academic and other libraries awaiting the implementation of online public access catalogs, states without highly developed cooperative systems all over the country, are considering CDROM catalogs as a way to meet their bibliographic access needs either over the short term or permanently.

FOOTNOTES

1. The full report of this project, Paula D. Watson, *Creation and Demonstration of the Optical Disk Version of the University of Illinois/River Bend Library System Catalog*, (Urbana, Illinois, 1986) 74 pp.

2. Dale Brandenburg, Associate Head, Division of Measurement and Evaluation, Office of Instructional and Management Services, University of Illinois at Urbana-Champaign and Graduate Assistant Ping der Wang were involved in the evaluation phase of the project.

3. Professor F. Wilfrid Lancaster of the UIUC Graduate School of Library and Information Science was the consultant on this aspect of the investigation.

4. Bill Zoellick, "File System Support for CDROM," in *CDROM. The New Papyrus*, ed. Steve Lambert and Suzanne Ropiequet (Redmond, Washington: Microsoft Press, 1986), p. 107.

5. Judy McQueen and Richard W. Boss. *Videodisc and Optical Disk Technologies and their Applications in Libraries. 1986 Update*. (Chicago: American Library Association, 1986), p. 64.

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DIALOG BUSINESS CONNECTION: DIALOG FOR THE END-USER

by Mick O'Leary
Director
The Data Brokers

The DIALOG Business Connection opens the second stage of DIALOG's drive to become the pre-eminent supplier of online business information. The first stage has been taking place over the past four and a half years, during which DIALOG has multiplied its business-related resources. Among the nearly five dozen new databases have been several conventional bibliographic files (**Trade and Industry Index**, **FIND/SVP Reports**, **Industry Data Sources**, etc.), but most of the growth has been in other kinds of databases: statistical (**Media General Databank**, **Donnelley Demographics**, **CENDATA**, etc.); directories (**Dun's Market Identifiers**, **ACT I**, **Thomas Register Online**, etc.); full text (**Trade and Industry ASAP**, **INVESTEXT**, etc.); and, vertical market (**BioBusiness**, **AGRIBUSINESS U.S.A.**, etc.). For the business researcher, DIALOG has not only left its nearest competitors, BRS and SDC, far behind, it also has mounted a wider range of data than anyone else.

But the average businessperson is still discouraged from using all this information because of the nature of DIALOG itself; to thousands of professional searchers, DIALOG's search system is a marvelous tool, but to millions of potential end-users it is hopelessly complicated and intimidating. Despite all the propaganda that a business will live or die on the quality of its information, online suppliers have learned that most businesspeople are just typical end-users, who will simply not bother with online databases if there are too many obstacles in their way.

The DIALOG Business Connection (DBC) is DIALOG's attempt to remove these obstacles: a user-friendly, menu-driven interface to two dozen key DIALOG business databases. According to DIALOG President Roger Summit, DBC has been ". . .principally an internal development. . .the conceptualization of the design group interacting with a select group of experienced customers." The result is a venturesome departure that has taken the fundamental characteristics of DIALOG, turned them inside out, and rebuilt them from the point-of-view of the end-user:

- **Menu-driven rather than Command-driven**. Summit notes that "In order to get to end-user searching, we would have to go beyond the DIALOG language." The answer is an elaborate and carefully designed menu system which the end-user can use effectively with no training or experience.
- **Results Orientation**. Summit recalls that a major design constraint of DBC ". . .is that it would be oriented toward primary information rather than reference information, so that people could get a result, rather than a reference to a result." **PTS PROMT** is the only bibliographic database on DBC, but its abstracts are so lengthy and detailed that it acts, in effect, as a textual source.
- **Applications Approach**. A DBC search begins by selecting a type of data rather than a database, and the user never does know which database is actually being searched. This emphasis on "data" rather than "database," according to Summit, came from customers, "The users did indeed contribute. . . in terms of what were the typical and most frequent uses made of business databases, and the result of that question came out to be the main menu items."

Summit expects that these features will combine to achieve something that so far has eluded DIALOG—to make it approachable to the end-user:

"I think a lot of people who have been hes-

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itant or afraid, and I define fear in a very special way—fear of wasting time, fear of non-results—who have been afraid of the general search system, are certainly not intimidated by the questions and the process involved in the Business Connection."

APPLICATIONS: ORGANIZING DATA FOR THE END-USER

DBC is arranged into five "Applications," or broad ways in which business data is used. The searcher begins by selecting an application, and then follows a series of successively more precise menus until the desired type of information is reached. This instruction is translated into a DIALOG command, searched on an appropriate database, (see Figure 1) and the results displayed. Users cannot get at the entire database because they are limited to the kinds of information reached by the DBC menu structure. Nevertheless, these pathways are sufficiently extensive and precise that most end-users will find that they meet all their needs. Each of the five Applications has databases, menu structures, and display options appropriate for that particular kind of information:

1. Corporate Intelligence. This company data application will provide information about company profiles, product lines, officers, performance statistics, recent activities, and analysis. The first menu gives a choice of four basic kinds of company information:

1. Corporate Description and Location
2. Recent Developments (Current 6 Months)
3. Financial Reports (Public Companies)
4. Analyst's Reports (Public Companies)

The next menu divides each of these broad categories more specifically. The follow-up menu for #1 "Corporate Description and Location," for example, permits a more precise choice among company data elements:

1. Company Name and Address for All Locations
2. Company Name and Address for Corporate Headquarters
3. Corporate Family Hierarchy (Public Companies)
4. Corporate Background (Public Companies)
5. Company Profile
6. List of the Company's Products (Manufacturers)
7. List of the Company's Key Executives

Each choice from the first menu has its own distinctive follow-up menu. For example, the follow-up menu for #2 "Recent Developments," includes choices like "Personnel Changes," "Mergers," "Stock News," etc.

Users are then prompted to enter company name or ticker symbol, whereupon DIALOG takes over and searches the database which it has determined to be the best for that query: "List of Company's Products" searches the Thomas Register Online; "Analyst's Reports" searches INVESTEXT, etc. DIALOG has been very discriminating in selecting which database will be searched at the end of each menu pathway. There are, for instance, several files which could have been used for "Corporate Background," but DBC uses **Standard & Poor's Corporate Descriptions**, whose Company Background field is unusually thorough.

2. Financial Screening. Financial Screening permits detailed comparisons among public companies for merger, acquisition, and investment candidates. Its initial menu offers several different search criteria:

1. Screen on the Balance Sheet
2. Screen on the Income Statement
3. Screen on Financial Ratios
4. Screen on Stock Price Variable
5. Screen on Stock Volume Variable
6. Screen on Industry Comparison Variable

Menu choices #1 and #2 will search **DISCLOSURE Financials** for company performance data; the rest will search Media General Databank for stock performance data. As in Corporate Intelligence, each menu choice leads to a more specific list, as in the case of #3 "Screen on Financial Ratios":

1	Price/Earnings Ratio	6	Profit Margin
2	Price/Revenue Ratio	7	Return of Shareholder's Equity
3	Liquidity Ratio	8	Dividend Yield
4	Current Ratio	9	5 Year Revenue Growth Rate
5	Debt/Equity Ratio	10	5 Year Earnings Growth Rate

In regular DIALOG, the searcher would have to enter a value or range of values in a search of this kind, but the whole point of DBC is that the user need not know this sort of detail. DBC accomplishes this by giving the user another menu, this one containing different values for the desired variable. When asking for #1 **Price/Earnings Ratio**, the user does not have to know or guess how to enter the proper format, but instead simply chooses it from a menu of price/earnings ratios:

1	Less than	6.9
2	Between	7.0 and 9.9
3	Between	10.0 and 12.9
4	Between	13.0 and 17.9
5	Between	18.0 and 24.9
6	Greater than	24.9

This menu serves a purpose in DBC similar to that of the **EXPAND** command in regular DIALOG—to provide the proper format for a search element when the searcher does not know it. These "range of values" menus are generously supplied throughout DBC, and are an excellent solution to the recurring dilemma of how to enter a term correctly.

Having selected a particular value, the user then has the option of returning to the menus and selecting additional criteria, making possible a very precise search. "Stacking" menu choices in this fashion operates like a Boolean

AND on regular DIALOG, and is another user-friendly equivalent to a feature on the command system.

3. Products and Markets. Most of DBC retrieves company data, but "Products and Markets" looks at the whole business environment:

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1 List of Manufacturers
2 Share of Market Data
3 Market Information
4 Product Design and Processes
5 Facilities and Resources
6 Unit Costs and Resources
7 Analyst's Reports on Industries
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Products and Markets goes into the Thomas Register Online for manufacturers lists, into the **Trinet Establishment Database** and **PTS PROMT** for share-of-market reports, and into PROMT and INVESTEXT for analysis and statistics on products, industries, markets, etc. Products and Markets is the most wide-ranging DBC Application, but also the least efficient, since it is the only one which does not rely solely on a pure menu approach. In several of its pathways, users are prompted to enter a subject, where they face all the pitfalls and missed opportunities inherent in a subject approach (Figure 2). This can be especially problematic for end-users who, as a rule, are less adept at manipulating search terms than are experienced searchers.

DBC does provide two alternatives for entering a subject. Users can enter Predicasts' codes, and there is also a multistep expansion of the Standard Industrial Classification (SIC) Codes (see Figure 3). Both are only partial solutions to the problem of choosing the right term. The small number of users who are familiar with Predicasts' codes will find them helpful, but for everyone else they detract from DBC's immediacy, while the SIC codes are far too imprecise for many subject searches.

Because of the unavoidable uncertainty of subject searching, users are more likely to get unsatisfactory results from Products and Markets than from anywhere else in DBC. In the other Applications, users may be effective from the start. But before they can be consistently successful here, they may need experience in using the Predicasts' and SIC codes, and in subject searching.

4. Sales Prospecting. This Application, like Financial Screening, is a list generator, but its emphasis is upon getting a little bit of data on many companies rather than a lot on a few. Sales Prospecting goes into Dun's Market Identifiers, the best company file for getting a brief but informative profile on a very large number of public and private companies. Four criteria can be used to define the search requirements:

- Geographic Location
- Type of Industry (defined by SIC codes)
- Size of Company
- Company Status (Branch/non-Branch locations)

Users are given the option of defining values for each criterion in succession. The values are obtained from menu expansions similar to those in Financial Screening. As in Financial Screening, they are very precise, and when "stacked" can produce search results that will meet very exacting requirements (Figure 3).

5. Travel Planning. This is a simple gateway to the **Official Airline Guide Electronic Edition**. Since the OAG is itself menu-driven, DBC provides no additional search assistance.

DIALOG has made a judicious selection of business subjects and of the databases to supply the information for them. Although DBC draws upon only a handful of DIALOG's business databases, they are major files that will answer most of the questions of DBC's intended users. There are popular kinds of business information which DBC does not supply—forecasts and foreign company data are a few which can be mentioned—but if DBC's customers want them, there is a good chance that they will appear. Summit indicates that DBC will be market sensitive: ►

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"I think it may be somewhat analogous to Knowledge Index*. . .We started out with what I would say is a critical mass. . .and then we've continued to add databases, principally in response to requests that we got from customers of Knowledge Index, and I think that pattern will probably follow with DBC."

MENU-DRIVEN SEARCHING: GETTING DATA TO THE END-USER

The decision to develop a menu-driven system, a radical step for a sophisticated, "user-friendly," command-driven system like DIALOG, was not undertaken casually. Summit reflects that:

"When you look at a full-blown Boolean search system and you compare it with a menu system, the question always is 'How much power are you giving up between the pre-structured language and the menu-oriented process?' I had not seen applications that satisfactorily offered a menu-oriented system without giving up substantial retrieval power. I was concerned as to whether we had effectively gone beyond the other menu-driven systems that I'd seen."

Summit can feel pleased with the result, for the DBC search process is an effective combination of simplicity and precision (Figure 3). The only prerequisite for a DBC searcher is a basic knowledge of the organization of business information. Since this is axiomatic for DBC's likely users, they will find that the menus will lead them through a successful search on the first logon. The system is precise enough that experienced DIALOG searchers can also use it with confidence. In fact, professional searchers who are not regular users of the DBC databases might even prefer to use DBC instead of directly searching complex and expensive files with which they are not at all familiar.

The success of DBC's menu process is due to two factors: the nature of the data and the thoroughness of the menu organization. Most of DBC's searches are conducted in directory and statistical files which lend themselves to a menu approach. When searching on a company name, a ticker symbol, or a range of values, there is little ambiguity about the search statement, and ambiguity is where menu systems founder. Thus it is not coincidental that this approach is weakest in Products and Markets, where it is often necessary to enter subject terms.

DBC is available 24 hours a day, seven days a week, and is accessed the same way as regular DIALOG. Subscribers who belong to both services can transfer back and forth with a single command.

DBC's menus have also been devised to leave as little to chance as possible, relying on the system, rather than the user, to supply the proper format when a value is to be entered. The "range of value" menus that are liberally scattered throughout DBC save users from having to scurry around to manuals or reference sources to get the proper SIC code, company size format, etc., or from having to guess and possibly end up with a failed search.

As can be seen in the sample search from Sales Prospecting (Figure 3), each Application has its own individual set of menus and search features. In Corporate Intelligence, for example, if an ambiguous company name is entered, DBC responds with a name expansion from which the proper one can be chosen. When a subject is entered in Products and Markets, the term may be reformulated in different ways, according to the particular menu option. One example of a hidden search refinement is described by DBC Project Manager Connie Zuga, "In some cases, if nothing is found with the first search that's tried, then there's a back-up command which goes into effect which may search other fields."

One major problem with a menu system, especially one as elaborate as DBC's, is that it can be very time-consuming and aggravating to complete an entire menu cycle. But DBC does have features to speed up the process. There are conventional navigational commands for going directly to menus or back and forth among screens. At many points in the menu cycle, there is a continuation screen (see Figure 3), whose options can be used to modify or redirect the search without starting from the beginning. Menu choices can also be stacked, a major advantage for those who are familiar with the system, and especially useful when repetitive searches are done. In fact, by stacking an entire set of menu selections (not, admittedly, a common likelihood), a DBC search can be done as rapidly as a similar search on regular DIALOG. If there is one menu system convenience that DBC lacks, it is the ability to customize prompts. Often the DBC prompts and screen lead-ins are lengthy and unduly

* DIALOG's night-time, end-user version.

repetitive to the experienced user. If users had the option to pre-set the system to deliver brief prompts, as can be done on some end-user databanks, they could use the menus more quickly.

Data display options also vary with the Application. In Corporate Intelligence and Products and Markets, searches are done on different kinds of databases: when the search has been done on a directory file, the record can be displayed at once; on a textual file, records can be read directly, or their titles viewed in order to be more selective. In Financial Screening and Sales Prospecting, several different record formats can be chosen (Figure 3), with options to sort or to display in the DIALOG Report format.

SYSTEM FEATURES: SIMPLIFYING FOR THE END-USER

Documentation. The DBC *User's Guide* is lengthy, specific, and clearly written. Like DBC itself, it assumes a knowledge of business terminology, and concentrates on the arrangement of the Applications, the menu structures, and using DIALOGLINK software. At most points in a DBC search, there is an online help screen with a brief description of the data element or search option. DIALOG customer service reps are prepared to handle DBC help calls.

DIALOGLINK. Two copies of DIALOGLINK, DIALOG's communications software, come with the purchase of a DBC subscription. This is consistent with the DBC philosophy of removing obstacles, according to Connie Zuga:

> "The idea we had in including the communications software was that we wanted to create a one-stop shop. . .we wanted to shorten the time between when the customer gave us an order and when they were actually able to get started."

Performance and Access. Response time when using the menus is excellent. Searching and record display response depends on DIALOG, and are subject to the hesitations which characterize it during peak usage periods. DBC is available 24 hours a day, seven days a week, and is accessed the same way as regular DIALOG. Subscribers who belong to both services can transfer back and forth with a single command.

Costs. DBC has an $84.00 per hour connect rate, regardless of which application or database is being used, and record display charges which are identical to those on DIALOG. In general, DBC is more expensive than DIALOG, but to a degree which will vary considerably depending on which Application is being searched and how efficiently the menus are being used.

For a closer comparison, the same search was done on both systems, using Standard & Poor's Corporate Descriptions, which at $85.00 per hour has a connect rate almost identical to DBC's. On DIALOG the search was done with stacked commands, on DBC with the regular menus: the DBC search was almost 50% higher. This, however, should not be taken as a representative differential. If the search is repeated on DBC, but with stacked commands, the costs are very close to those on regular DIALOG. And, if a quick, stacked command search is done on DBC in one of the much more expensive files, DBC could even be cheaper than DIALOG.

There is a $145.00 sign-up fee—$120.00 for DIALOG subscribers—which includes two DIALOGLINK communications disks (not the Account Manager), the *User's Guide*, and $100.00 worth of free time. There are no monthly minimums or other fixed costs. Users can monitor their costs with two online cost features: a price list of record display charges, and a display of the cumulated search cost.

DIALOG BUSINESS CONNECTION: THE FUTURE OF END-USER SEARCHING?

As a simple way to reach a wide range of business information, the DIALOG Business Connection is the standard against which others must now compare themselves. There are numerous databanks which have far more data on specialized business topics, especially investment and economics, but the only one at all comparable to DBC, for range of data and ease of access, is Dow Jones News/Retrieval. The two have several databases in common, but DJN/R, with its extensive data on securities and markets, is generally more useful to the investor. But DBC is far more useful for researching private companies, manufacturing, industry activities, market trends. . .indeed almost any business topic except investment and breaking news.

As a simple way to reach a wide range of business information, the DIALOG Business Connection is the standard against which others must now compare themselves.

DBC's closest competitor is actually another

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intricate, host-based interface: EasyNet. EasyNet provides the end-user with a well-designed, menu-driven gateway to DIALOG and several other databanks. Over the past several months, EasyNet has been redefining their interface to dozens of important business databases, including almost all of the files reached through DBC. These enhancements, which permit very precise searching, make the comparison between EasyNet and DBC even closer. Because of the complicated differences between their databases, costs, and search systems, it is impossible to make simple comparisons between the two services. Perhaps the clearest distinction results from the fact that DBC is part of DIALOG while EasyNet is an intermediary, making DBC considerably faster.

But differences aside, DBC and EasyNet strikingly demonstrate the advantages of having a search assistance interface mounted on the host, rather than on a disk-based software package. Host-based interfaces can be far more elaborate and informative than can those on a disk. They are also far easier to update and to enhance. Finally, start-up costs are much less. For the business researcher, there is now little reason to use a disk-based interface, and this may soon apply to other subjects as well. Connie Zuga describes DBC as only ". . .the first of the 'professional connection' packages that DIALOG is introducing."

The only advantage of software-based products is in pre- and post-search operations, but there are numerous inexpensive communications packages, including DIALOGLINK, which can do these things quite well. It is possible that EasyNet, and now DBC, foreshadow the end of disk-based front end search assistance interfaces, even before this kind of software is established.

It is possible that EasyNet, and now DBC, foreshadow the end of disk-based front end search assistance interfaces, even before this kind of software is established.

DBC is an impressive solution to the "last problem" of online information. The advantages of online access in terms of speed, efficiency, and searching power are profound, but the difficulties of complex command systems like DIALOG's have effectively limited online use to information specialists and a handful of others who have taken the trouble to acquire the necessary expertise. DIALOG hopes to fill this gap with DBC, a "bonehead" system that still has all the searching power that most people will ever need. In Summit's words, DBC is an online product that also has the predictability that is essential for the mass market:

> "I think there's a philosophical point. . . which involves risk of failure, your perceived risk of wasting time: 'I'll hesitate to spend ten minutes if it may be a waste of time, but I'll be glad to spend ten minutes and get productive output.'—You'd rather take that course, even though the productive output might be a little less, than take the first course, where you know you're going to spend ten minutes but you may not have productive output."

Summit's remarks demonstrate a keen awareness of how the average person consumes information, and he may find that the business community will be quite satisfied with the trade-off between DIALOG and DBC. Perhaps, at last, professional searchers may not be the only ones to appreciate DIALOG's latest accomplishment.

FIGURE 1

DATABASES SEARCHED IN BUSINESS CONNECTION APPLICATIONS

Corporate Intelligence

D&B—Dun's Market Identifiers
D&B—Million Dollar Directory
DISCLOSURE Financials
DISCLOSURE Management
Electronic Yellow Pages
INVESTEXT
Media General Databank
Moody's Corporate Profiles
PTS PROMT
Standard & Poor's Corporate Descriptions
Standard & Poor's News
Standard & Poor's Register—Corporate
Thomas Register Online

Financial Screening

DISCLOSURE Financials
Media General Databank

Products and Markets

INVESTEXT	Thomas Register Online
PTS PROMT	Trinet Establishment Database

Sales Prospecting

D&B—Dun's Market Identifiers

Travel Planning

Official Airline Guide Electron ition

FIGURE 2

"PRODUCTS AND MARKETS" SEARCHES WITH VARIANT SEARCH TERMS

In seeking information on laser storage technology, any of the search statements might be entered by the end-user, with results that vary from excellent to disappointing. The last two statements, where several variant search phrases are entered at once, is the best strategy, but many end-users will not bring this kind of sophistication to a search.

Search Term	Number of Postings	Date of Most Recent Posting
CDROM	2	12/85
COMPACT DISCS	3	3/85
COMPACT DISKS	3	6/85
LASER DISCS	7	12/85
LASER DISKS	2	10/84
OPTICAL DISCS	18	3/86
OPTICAL DISKS	6	2/86
VIDEO DISCS	50	11/85
VIDEO DISKS	1	3/82
VIDEODISCS	18	84
VIDEODISKS	3	3/85
VIDEODISCS, VIDEO DISCS, COMPACT DISCS, OPTICAL DISCS, LASER DISCS	50	3/86
VIDEODISKS, VIDEO DISKS, COMPACT DISKS, OPTICAL DISKS, LASER DISKS	14	2/86

FIGURE 3

SAMPLE BUSINESS CONNECTION SEARCH

Sample Business Connection Search, demonstrating how the Sales Prospecting Application can be used to generate a list of computer service companies in three adjacent Maryland counties. Many Business Connection searches are much shorter than this one, requiring a half-dozen menus or less. This one was chosen to show how the Business Connection handles a complex search, and to give examples, such as the State, County, and SIC Codes menus, of the many kinds of user assistance that are built into the search process.

DIALOG Business Connection
Main Menu

1 Corporate Intelligence
2 Financial Screening (Public Companies)
3 Products and Markets
4 Sales Prospecting
5 Travel Planning: OAG Electronic Edition

►

FIGURE 3 (continued)

```
Enter option number, or /H for help

? 4


                    Sales Prospecting Application

This application is designed to locate a set of likely sales prospects, using the following four criteria
to define the desired target base:

                    Geographic Location
                    Type of Industry (defined by SIC codes)
                    Size of Company
                    Company Status (Branch/non-Branch locations)

          Enter RETURN to continue, or /H for help:

          ? RETURN

                    Sales Prospecting Geography

                      1  Entire United States
                      2  Regions
                      3  Individual States
                      4  Counties
                      5  Cities
                      6  Telephone Area Codes
                      7  Zip Codes (3-digit level)
                      8  Zip Codes (5-digit level)
```

FIGURE 3a

```
Enter option number, or /H for help:

? 4

                    Sales Prospecting Counties

 1  Alabama          14  Illinois         27  Montana          40  Rhode Island
 *  Alaska           15  Indiana          28  Nebraska         41  South Carolina
 3  Arizona          16  Iowa             29  Nevada           42  South Dakota
 4  Arkansas         17  Kansas           30  New Hampshire    43  Tennessee
 5  California       18  Kentucky         31  New Jersey       44  Texas
 6  Colorado         19  Louisiana        32  New Mexico       45  Utah
 7  Connecticut      20  Maine            33  New York         46  Vermont
 8  Delaware         21  Maryland         34  North Carolina   47  Virginia
 *  Dist. of Columbia 22 Massachusetts    35  North Dakota     48  Washington
10  Florida          23  Michigan         36  Ohio             49  West Virginia
11  Georgia          24  Minnesota        37  Oklahoma         50  Wisconsin
12  Hawaii           25  Mississippi      38  Oregon           51  Wyoming
13  Idaho            26  Missouri         39  Pennsylvania

  * County selection not available

Enter option number, or /H for help:

? 21

                    Sales Prospecting
                    Maryland Counties

 1  ALLEGANY         13  HOWARD
 2  ANNE ARUNDEL     14  KENT
 3  BALTIMORE        15  MONTGOMERY
 4  CALVERT          16  PRINCE GEORGE'S
 5  CAROLINE         17  QUEEN ANNE'S
 6  CARROLL          18  ST. MARY'S
 7  CECIL            19  SOMERSET
 8  CHARLES          20  TALBOT
 9  DORCHESTER       21  WASHINGTON
10  FREDERICK        22  WICOMICO
11  GARRETT          23  WORCESTER
12  HARFORD

Enter option number, list or range of option numbers, or /H for help:

? 10,15,21
```

FIGURE 3b

Sales Prospecting Industry

1 All Industries
2 Selected Industries

Enter option number, or /H for help:

? 2

Sales Prospecting Industry Selection

Enter 2, 3, or 4 digits of a Standard Industrial Classification (SIC) Code, or RETURN for a series of menus to aid you in selecting the desired SIC code.

Enter specific SIC Code(s), RETURN, or /H for help:

? RETURN

Sales Prospecting SIC Code (1st Digit)

0 Agriculture, Forestry and Fishing
1 Mining & Construction
2 Manufacturing (list 1)
3 Manufacturing (list 2)
4 Transportation, Communications, and Public Utilities
5 Wholesale & Retail Trade
6 Finance, Insurance, and Real Estate
7 Services (list 1)
8 Services (list 2)
9 Public Administration

Enter option number, or /H for help:

? 7

Sales Prospecting SIC Code (2nd Digit)

SIC 7 – Services

0 Hotels and Other Lodging Services
2 Personal Services

FIGURE 3c

3 Business Services
5 Automotive Repair, Services, and Garages
6 Miscellaneous Repair Services
8 Motion Pictures
9 Amusement and Recreation Services

Enter option number, "+" for additional service industry options, or /H for help:

? 3

Sales Prospecting SIC Code (3rd Digit)

SIC 73 – Business Services

1 Advertising
2 Credit reporting and collection
3 Mailing, reproduction, stenographic
4 Services to buildings
5 News syndicates
6 Personnel supply services
7 Computer and data processing services
9 Miscellaneous business services

Enter option number, or /H for help:

? 7

Sales Prospecting SIC Code (4th Digit)

SIC 737 – Computer and data processing services

2 Computer programming and software
4 Data processing services
9 Computer related services, nec

Enter option number, or /H for help:

? 2

FIGURE 3d

```
Sales Prospecting Size

1  All Sizes
2  By Total Sales (not available for branches)
3  By Number of Employees at Each Location
4  By Total Number of Employees (not available for branches)

Enter option number, or /H for help:

? 1


Sales Prospecting Company Status

1  All Sites, Including Branch Locations
2  Branch Locations Excluded

Enter option number, or /H for help:

? 2


Sales Prospecting Continuation Options

There are 67 companies available.

1  Review Selection Criteria
2  Display Results
3  Modify Geography
4  Modify Industry
5  Modify Size
6  Modify Company Status
7  Start Over with New Criteria

Enter option number, or /H for help:

? 2


Sales Prospecting Display Options

There are 67 companies available, which will be displayed in alphabetic order by Company Name.
```

FIGURE 3e

```
1  Telemarketing Report
2  Mailing Labels
3  Company Profiles
4  Company Name Listing
5  Sort Selection
6  Price and Source

Enter option number, or /H for help:

? 3

Sales Prospect selection 1 of 67
1019247
ACCUDATA CORPORATION
AUTOMATED BUSINESS TECHNOLOGY
2919 E OLNEY SANDY
OLNEY, MD 20832
```

(The rest of the company profile, from Dun's Market Identifiers, is displayed, followed by subsequent records.)

THE AUTHOR

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END-USER SEARCHING IN A LARGE LIBRARY NETWORK: A CASE STUDY OF PATENT ATTORNEYS*

by Alice J. Vollaro
and
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AT&T Bell Laboratories
Murray Hill, NJ

INTRODUCTION

End-users are having a growing impact on the online searching world. Front end interfaces to online retrieval systems [1], articles on online searching in the popular literature, and direct marketing of databases and retrieval services to end-users are signs that cannot be ignored. Many of the previous studies in this area have addressed the academic and small business arenas; comparatively little has been written about end-users in organizations served by well developed technical or special libraries and information centers. This article describes a group of users doing their own searching at AT&T Bell Laboratories, which is fortunate to benefit from a highly sophisticated and automated Library Network. [2]

AT&T Bell Laboratories employees have long had access to online retrieval systems through an Information Retrieval Service (IRS) staffed by subject specialists, plus a cadre of Reference Librarians, one or more of whom is stationed in each local library. The IRS Information Scientists have substantial technical and scientific knowledge; they are well equipped to handle complex literature and patent searches (especially in scientific and technical subjects), retrieve numeric and statistical information, compile extensive bibliographies, and consult with customers on information problems. Most of the Reference Librarians also have technical backgrounds and are experienced searchers. Requesting searches is deliberately made as simple and informal as possible; responsiveness and service to the customer are regarded as highly important.

In the more than 12 years since online retrieval has been offered to AT&T Bell Laboratories employees, thousands of searches for customers have been done by intermediaries. Recently, however, a group of patent attorneys obtained their own passwords on the DIALOG system and began to do their own searches. In an environment with a well developed information service, why would an employee wish to do his or her own searching rather than take advantage of the services and expertise provided by the Library Network? What type of person would turn to the intermediary service, and what type would search independently? If people were doing their own searches, were they satisfied with the results? We decided to interview the patent attorneys to see if we could learn the answers to these questions. Not all the attorneys were doing their own

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* A talk based on this article was presented at the ONLINE '85 Conference, New York, November 4, 1985.

searches; some of them still relied on the IRS or the Reference Librarians to satisfy their information needs. We included both those doing their own searches and those using the intermediary services in our study.

METHOD

Initially, we obtained names of some of the attorneys doing their own searching from informal sources, such as IRS staff; later we obtained a list of those attorneys who had attended a DIALOG training course. We limited our study to searching done on the databases available through DIALOG (several attorneys were also using the **LEXIS** system).

The initial data were gathered in a series of personal interviews. About midway through the project, we found we needed more extensive data, so the questionnaire shown in the Appendix was distributed. As we learned more about the complex field of online patent searching, the major thrust of the questions changed from "Why do you do your own online searching?" to "How has online searching changed your job performance?"

RESULTS

Table 1 shows the number of attorneys who used various databases. The major ones used were **CLAIMS**, **INSPEC**, and **Compendex**. Other databases mentioned by the attorneys (all only once each) were **DIALINDEX**, **Conference Papers Index**, **SPIN**, **Federal Register Abstracts**, and **Trademarkscan**. (The **Derwent** database had not become available on the DIALOG system at the time of our study.) We were interested to note that both patent and subject (prior art) searches were being done, but the range of databases used was small, considering that over 150 databases were available on the DIALOG system. (On the other hand, the subject coverage of many databases was not relevant to the attorneys' needs.)

In his study of end-user searching in a high technology environment similar to AT&T Bell Laboratories, Richardson [3] found that his end-users showed "high initial enthusiasm, a period of settling out, and a final cadre of dedicated proficient users." Our study confirms Richardson's results; of the 22 attorneys surveyed, 12 (55%) still do their own searches, 3 (14%) continue to rely on the intermediary, and 7 (32%) use a combination of the two methods. Online searching was made available to all the attorneys; the three who rely on intermediaries strongly defended their method of retrieving information, citing the expertise of the intermediaries, lack of time, and little interest in learning the intricacies of searching. On the other hand, several of the 12 attorneys who still do their own searching have become quite proficient as searchers, seem to enjoy it, and rarely (if ever) use an intermediary.

Table 2 shows details of the base locations of the attorneys and their modes of searching. The locations other than Murray Hill have the highest number of attorneys who do their own searching; Murray Hill had only one attorney searching directly. The centralized IRS is located at Murray Hill; our observation suggests that attorneys located elsewhere have resorted to doing their own searching to compensate for a perceived lack of easy access to highly trained intermediaries.

Table 3 shows some data on 17 of the attorneys who do their own searching. Eight (47%) attorneys are self-taught; the remainder mentioned taking a training course on the DIALOG system. It was interesting to discover that two attorneys used the expertise of a professional intermediary (a Reference Librarian) to obtain training. The usage distribution for these 17 attorneys is bimodal; seven did 10 or fewer searches/year, and 10 conducted 20 or more. Four attorneys became quite heavy users, performing 50 or more searches a year.

Even though some of the attorneys became frequent users of online databases, their average search times were longer than AT&T Bell Laboratories' professional searchers. Two attorneys reported spending about two hours per search on the average; six others had average search times in the 40-60 minute range. Only two attorneys did searches that averaged 15 or fewer minutes in length. These data contrast to an average search time of 20-25 minutes for the professional intermediaries [4]. As we observe from the final column of Table 2, most of the attorneys are fairly inexperienced searchers, with three or fewer years of experience. Even the attorney with four years of experience, who did 90 searches a year, reported an average search time of 45 minutes. Roughly estimating from Table 2 that an attorney did 25 40-minute searches a year, on the average, we can calculate that the average user in this study spent about 16 hours a year searching. Compared with professional searchers at AT&T Bell Laboratories and other companies who can easily spend 16 hours or more *a month* online, these users have a low level of experience, which explains their long connect times.

DISCUSSION

We are well aware of the small sample of our study, and we do not suggest that our end-users are typical of all end-users of information systems. Indeed, they are not. AT&T Bell Laboratories patent attorneys function in an extremely computer-oriented environment; each one has a terminal on his/her desk and is encouraged to use it as much as possible to

streamline their work. In such a situation, it seemed only natural to extend the use of the terminal to online searching. No doubt, without an incentive many attorneys would not have considered attempting their own online searches. What began as a grass-roots movement by one attorney feeling the lack of access to a professional searcher has become an extensive end-user movement.

What began as a grass-roots movement by one attorney feeling the lack of access to a professional searcher has become an extensive end-user movement.

Direct interaction with the terminal has the advantages of allowing the searcher to get immediate feedback, quickly evaluate the progress of the search, and update the search logic interactively. But these advantages are also available when using an intermediary, particularly if the customer and searcher are physically together when the search is done; why then would an attorney be motivated to try searching directly? Our interviews showed that there are other reasons: the convenience of having a terminal at one's fingertips and the flexibility of being able to search when it is convenient (even after hours) outweighed the potential time (and therefore direct cost) savings of using an intermediary. One attorney even went so far as to say he was uncomfortable looking over someone's shoulder during a search! Nearly every attorney mentioned "time and convenience" as two of the most important reasons for doing their own searches. Convenience included not having to wait for a search to be done or make the effort to contact an intermediary and get into a job queue.

Unlike information specialists who are required by the nature of their work to learn the nuances of many databases or databanks, patent attorneys felt they needed to be concerned with at most two or three databases on one databank. Once competence was reached on a few files, these end-users became comfortable and satisfied with their results. We were particularly surprised to note that the attorneys limited their patent searching to the CLAIMS databases, which contain only U.S. patents, and showed no inclination to learn the ORBIT system so they could search the Derwent database (recall that Derwent was not available on the DIALOG system at the time of our study). In many searches, the attorneys used the online databases as an entry point for more extensive manual searching. Since AT&T Bell Laboratories organized its patent files in subject rather than chronological order, the online databases were used for known-item or similar-item retrieval which would have been tedious in the manual files. (This has now changed; see "Followup".)

We attempted to determine how satisfied the attorneys were with the results of their searches, but we are unable to make any quantitative assessments because satisfaction is relative. From the point of view of the attorney or other end-user, information is a means to an end, and online searching is perceived as another way to reach an acceptable level of performance. Most of the attorneys were probably unaware of the amount of information available to them online. In contrast, information professionals may value the information as an end in itself and therefore may be more zealous in using many sources to fill a request. In patent searching, comprehensiveness is critical because completeness of the search determines whether an invention is unique and patentable. Patent attorneys, of course, are well aware of this, and if their online searches failed to meet their needs, they would not continue doing them. We therefore must conclude that they were at least partly satisified with their searches. Note that this does not mean that they considered their searches to be complete, but that their searches were useful and helped them to fill their needs. Once exposed to online searching, all the attorneys considered it essential to their work regardless of whether they or an intermediary did the searches.

Once exposed to online searching, all the attorneys considered it essential to their work regardless of whether they or an intermediary did the searches.

Our questionnaire asked the attorneys to discuss the areas where they had problems; we found they were not unaware of the difficulties of searching. Nearly all mentioned difficulty in finding appropriate search terms, particularly when the retrieval was not what they initially expected. Remembering the special features of each database, especially when use was infrequent, was troublesome. Other problems encountered were not knowing when all possible avenues had been pursued, forgetting commands, and inadequate search strategies. It is interesting to note that there was no men-

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tion of logging on or telecommunications difficulties, which have long been thought to be especially troublesome for end-users. We were also interested that little mention was made of possible ways to help overcome the problems, such as use of the EXPAND command to examine the online thesaurus, examination of controlled vocabulary terms in relevant items, retrieval of known items, etc. Nor was there any mention of special features of the databases, such as British spellings in INSPEC. We surmise that most of the attorneys had not progressed to a point of expertise to consider such important details.

CONCLUSION

If we could draw a composite picture of a typical AT&T Bell Laboratories patent attorney searcher, the person

- Is willing to learn a new skill that would enhance his or her work,
- Is comfortable with a computer terminal and aware of its capabilities and limitations,
- Is frustrated at some level with the way they are gathering information and wants control over this aspect of their job,
- Is satisfied with the results of their online searches, recognizing that they are probably not as comprehensive or as complete as a professional intermediary would obtain, and
- Receives encouragement to continue searching.

This study shows that end-users can do successful searches, even with only a little training. There are tradeoffs of time, convenience, and comprehensiveness in deciding whether to do the search directly or whether to use an intermediary. Some end-users find comfort in knowing they have direct access to online databases, even though they may use them only infrequently.

FOLLOWUP

The patent attorney study described here was conducted in early 1984. Two years later, just before this article went to press, we contacted several of the attorneys to determine if our conclusions were still valid. (Due to extensive reorganizations, many attorneys were unavailable, and many circumstances had changed.) We found that those who were comfortable with online searching in 1984 are still enthusiastically doing their own searches. Indeed, many of those attorneys had markedly improved their skills; all had become more familiar with online searching because they were making much more extensive use of the LEXIS system.

We found that those who were comfortable with online searching in 1984 are still enthusiastically doing their own searches.

The only patents available to attorneys in hardcopy are those issued to AT&T inventors; these are filed by inventor name. Subject access to patents and the need for the full text of patents online has therefore grown, explaining the increase in LEXIS use. The attorneys do their own searching on the LEXIS system because they consider it awkward and tedious to do full-text searching through an intermediary and because Mead, the producer of LEXIS, encourages end-user searching with special user-friendly terminals and commands. Front end systems have been adopted by some of the attorneys; a few spoke favorably of their experience with In-Search (now Pro-Search), produced by Menlo Corporation.

We found, therefore, that end-user searching continues to be used by the attorneys, and they find it useful. Some attorneys still use the DIALOG system successfully; most use LEXIS because of their need for full-text. In contrast to other organizations where end-user searching was not well received (see Reference 5, for example), in the AT&T Bell Laboratories patent organization, it continues to be used and to thrive.

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TABLE 1

DIALOG Databases Used by the Attorneys

Database	No. of Users
CLAIMS	15
INSPEC	12
Compendex	4
Conference Papers Index	1
DIALINDEX	1
Federal Register Abstracts	1
SPIN	1
Trademarkscan	1

TABLE 2

Locations and Searching Modes of Attorneys

Location	Search Mode		
	Direct	*Intermediary*	*Combination*
Holmdel	6	0	3
Murray Hill	1	3	3
Other	5	0	1

TABLE 3

Characteristics of Patent Attorney Searchers

Base Location	Training	Searches per Year	Average Connect Time (min.)	Years Experience
Holmdel	Self	2	45	1
Holmdel	Self	10	30	2
Holmdel	DIALOG course, peers	20	45	3
Holmdel	DIALOG course	20	120	3
Holmdel	Self	25	30	3
Holmdel	DIALOG course	25	20	3
Holmdel	Self	30+	40	2
Holmdel	Self, Ref. Lib.	>50	20	>1
Holmdel	Self, Ref. Lib.	100	45	1.5
Murray Hill	DIALOG course	2-3	120	1
Murray Hill	DIALOG course	6	30	>1
Murray Hill	Self	8	30	2
Short Hills	DIALOG course	4	60	>1
Short Hills	DIALOG course	30	30	1
Short Hills	DIALOG course	50	15	1
Whippany	DIALOG course	5-6	8	1
Allentown	Self, DIALOG course	90	45	4

APPENDIX

Online Searching Questionnaire

1. What technical degree do you have and in what subject?
2. Do you take advantage of online searching, either on your own or through the services offered by the Library Network?

Yes _____ No _____

3. If you answered no to Question 2, why not?

   _____ Not aware it was available
   _____ Don't consider it necessary to my work
   _____ Use manual indexes instead
   _____ Other (please specify)

4. If you answered yes to Question 2, do you:

   _____ Do your own searches
   _____ Use an intermediary (Reference Librarian or Information Retrieval Service)
   _____ Combination of both

5. Which online retrieval system(s) do you use?

   _____ DIALOG
   _____ LEXIS
   _____ Other (specify)

6. If you have most of your searches done by an intermediary rather than doing them yourself, please list the advantages you see in relying on the Library Network for this service.

7. Approximately how many searches did you do or have done for you since January 1983?

   On your own _____ With an intermediary _____

8. What kinds of information are you looking for most often when you do a search or have one done?

   Bibliographic references _____ Specific technical information _____

9. If you do your own searching on DIALOG:

   Where did you get your training?
   Which database do you search most often?
   How long have you been doing your own searches?
   About how much time does it take you to do a search?
   What are some of the problems you've encountered?

10. If you do your own searching, what do you see as the advantages?

THE AUTHORS

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USE OF INFOTRAC IN A UNIVERSITY LIBRARY

by Ann Bristow Beltran
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Indiana University Libraries,
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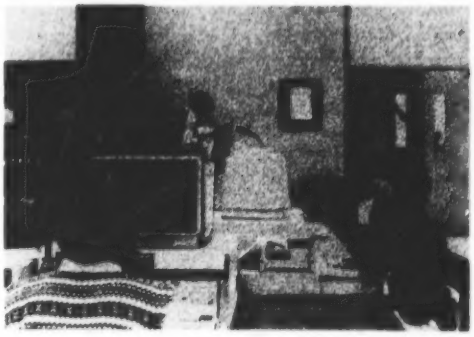
"Our objective in designing InfoTrac was to provide a tool which would improve the effectiveness of the reference area in two ways. It was to improve patron access to references from a broad-based range of periodicals while simultaneously reducing the demand for reference librarian time." —Richard D. Carney, Vice President, Information Access Company.

". . .the user finds a reasonable selection of relevant items grouped together. In InfoTrac, the (intellectual) process is greatly facilitated by the ease and speed with which one can move in and out of the subject file and print either selected references or entire pages.

"InfoTrac, for the first time, put computer-assisted reference into the hands of very large numbers of students without the direct involvement of a librarian. The system frees us (librarians) from various difficulties associated with telecommunications. . ."

—Ann Bristow Beltran

The potential offered by laserdisk technology for many library applications has been among the most exciting areas of discussion for several years. That excitement has been largely limited to discussion, however. There have been only a few real applications and virtually none in the area of most direct relevance to my work as head of a reference department in a large university library. As a reference librarian and an online searcher, I have been looking to this technology to offer essential help in extending the benefits of computer-assisted bibliographic searching of indexes produced by commercial publishers and scholarly societies. This essential help should be offered directly to the individual wanting the information. . . the "end-user," in that unhappy phrase. Academic libraries have been searching for solutions in this area and have found none, in my opinion. Two of the several problems which stand in our way are: 1) the multiple difficulties associated with telecommunications; and 2) the *unpredictability* of access costs for large numbers of users. . . an even greater obstacle, I believe, than the cost itself.



By using InfoTrac, these IU students have chosen to bypass using the "manual" reference guides and the "hand" writing of bibliographic citations. They quickly locate bibliographic citations. The citations are printed out in seconds.

This was the background when a colleague who had attended the 1985 annual ALA meeting returned to the department with an enthusiastic description of InfoTrac, the first commercial product, to my knowledge, to actually apply laser recording principles to this area of information storage and retrieval. We knew we wanted to try out InfoTrac and arranged for delivery of the product near the beginning of the 1985-86 school year.

INFOTRAC INSTALLED

A remodeling project was just ending at the time the system arrived, and space was cleared in the center of the reference/card catalog area of the main library to set up InfoTrac. It was uncrated, up and running (with the assistance of an IAC salesman), and had students using it within four hours of its arrival in the building.

►

"Students require very little help in using InfoTrac; less, in fact, than they do with comparable print indexes covering popular literature."
—Ann Bristow Beltran

Frankly, I was somewhat disappointed. I had seen, incorrectly, the InfoTrac system as a direct alternative to online searching. I had assumed that the system would allow some variety of the search options usually offered in online systems. Instead, the search capabilities were closer to the linear, displayed index of Information Access Company's microfilm products. What I had envisioned was a protocol closer to, but better than, their SEARCH HELPER, another excellent, pioneering idea of IAC's, but one which never worked for us at Indiana University.

Originally somewhat disappointed, today I am less so. I realize that I have specific ideas about how computer-assisted reference should operate. Our students, however, do not share those preconceptions, and watching them use InfoTrac suggests that this may be a useful, practical approach to searching *popular* literature. (More about other, scholarly databases later.) The great majority of our student users are working on a 3 to 10 page paper, are interested in current coverage of their subject, do not need or want an exhaustive literature search, and want to spend an absolute minimum of time locating a few relevant sources.

INFOTRAC AND STUDENT INTERACTION

InfoTrac restricts the user to the linear display of a controlled vocabulary file. The intellectual process involved is familiar to students, and a fairly straightforward one, offering its greatest challenge in second-guessing the indexers. Once that puzzle is solved, the user finds a reasonable selection of relevant items grouped together. In InfoTrac, the process is greatly facilitated by the ease and speed with which one can move in and out of the subject file and print either selected references or entire pages. It is here that the "computer" is really "assisting" in this system; and it is assistance highly valued by its users.

Students require very little help in using InfoTrac; less, in fact, that they do with comparable print indexes covering popular literature. I find it hard to imagine that this would be the case if the system offered more complex search options. As an online searcher, I am increasingly convinced of the intellectual challenge offered by the search options I expect and demand in online systems; and I have not yet seen a "front-end" that did more than disguise those difficulties and mystify me with its resulting products.

Online searching presents a special set of problems at Indiana University; experience and literature reports suggest that similar conflicts exist in most academic libraries. We offer two tiered online searching. If a patron is looking for an answer to a specific question and a librarian needs to use an online source to find the answer, there is no charge to the patron. However, if a printed or downloaded list of citations is requested, the fee is the actual cost for online access to the database. Online searching is done by librarians. While we are anxious to introduce greater numbers of students to the benefits of computer-assisted searching, we are constrained by the problems I have touched on earlier: *the unpredictability of both costs and telecommunications.* We have tried and continue to try a variety of approaches to introducing students and faculty to online searching—with varying degrees of success.

InfoTrac, for the first time, put computer-assisted reference into the hands of *very large numbers* of students without the direct in-

The system frees us from the various difficulties associated with telecommunications: passwords, tedious and time consuming procedures preceding use, and general unpredictability and unreliability. The single subscription price also allows for responsible fiscal planning and management within patterns which are familiar and effective for libraries.

volvement of a librarian. More than 2,000 potential users/uses per week can be accommodated in our configuration.

The system frees us from the various difficulties associated with telecommunications: passwords, tedious and time consuming procedures preceding use, and general unpredictability and unreliability. The single subscription price also allows for responsible fiscal planning and management within patterns which are familiar and effective for libraries. InfoTrac's hardware and software have been close to trouble-free, absolutely delightful compared to any automated system I have used; and this one has thousands of untrained, first-time users sharing the micros and printers.

We clearly communicated to students that our original use of InfoTrac was experimental; however, if we tried to discontinue it, we felt we might have risked a sit-in. No other reference tool has ever drawn the attention that InfoTrac has. As reported, the system arrived at the end of a remodeling project. Students quickly liberated chairs and sofas that were scattered around the area to set up an orderly waiting queue for access to the system. The four stations are in virtually constant use from the time the library opens at 8 a.m. until closing at midnight. We have had to ask students to limit their use of InfoTrac to 15 minutes to be fair to those who are waiting. Fifteen minutes should be abundant to perform any search on InfoTrac. We have wondered if our "experimental" subscription announcement has encouraged students to do every search they can imagine so that they will have information they may need in the event the system is not retained. That is not likely to happen. We may, however, move the system to our Undergraduate Library to bring it closer to our most relevant periodical collection and the unit whose mission it is to serve undergraduates. . .InfoTrac's primary users.

INFOTRAC EVALUATED

To evaluate the system and its value to students, we asked users to respond to a brief written questionnaire. Reference staff approached students using the system and asked them to complete the brief form, before leaving. It was felt this might result in a somewhat more representative sample than we would have received had we simply left the questionnaires to be filled out by those who chose to do so. That technique seems to attract a disproportionate number of those who are very pleased or very displeased. We have gathered some interesting information from the surveys; however, when school resumes after our lengthy winter break, we are going to conduct some personal interviews seeking further information on InfoTrac use. For instance, a fair number of students using the system report that they had no previous computer experience, yet they required no training to use the system. From this evidence, it might be assumed that there is no trepidation about "breaking" the system or appearing ignorant while other students are looking on as one becomes acquainted with InfoTrac. That assumption may not be correct. We are planning to ask students using print reference sources, why they are not waiting in the InfoTrac line. We hope this is one way we can determine how much, if any, "computer phobia" does exist that may prevent some students from even approaching InfoTrac.

We are also going to ask students who wait in the InfoTrac queue why they do not use the print periodical reference source which covers a similar area of popular literature and is available on a nearby table. The compelling nature of the product appears to go beyond the information it provides. Granted a search is fast, and the student has a "take-away" print out; yet, why would someone wait in line for fifteen minutes to begin a search which might be accomplished in 10 minutes by thumbing through a couple of indexes and jotting down the citations? These and other questions cannot be fully answered by our survey.

The initial survey revealed that students completed their searches in 10 to 15 minutes (the students timed themselves) and most reported finding needed citations. Again, the time perception and reality may vary because we have had students ask to set up appointments so that users would be prevented from remaining on the InfoTrac system for more than 15 minutes. A tighter monitoring system will reveal whether the users perceived 15 minutes is validated by the clock.

The greatest frustration created by the system is the retrieval of a citation for a source we do not own. Indiana University Libraries' collections constitute the 15th largest academic library in the country. I can conclude this will be a disappointment shared by many students in libraries which use the system. I have been told that Information Access Company has tried to match the collections of major academic libraries to the contents of InfoTrac and is reviewing some of the magazines and journals, particularly the regional business publications, with the thought to eliminating those likely to be found only in specific geographic areas of the country. That will be a considerable improvement.

Our survey polled approximately two hundred users over a three day period. The questions and summarized results follow: ►

InfoTrac is here on a TRIAL BASIS. Please help the library evaluate it by answering the following questions:

Please check your status with Indiana University:

Undergraduate 75.0% Graduate 20.0% Faculty 3.0% Staff Other 2.0%

Have you ever used a computer before? Yes 79.0% No 21.0%

	agree strongly	agree somewhat	neither agree nor disagree	disagree somewhat	disagree strongly
InfoTrac can be used without formal training or instructions. (circle one)	80.8%	18.0%		1.2%	
"HELP" screens provide valuable information for using InfoTrac.	50.0%	27.0%	11.6%	3.9%	0.7%
I found Information on my topic using InfoTrac.	64.0%	23.8%	2.6%	3.9%	2.6%
Overall, InfoTrac is easy to use.	84.0%	14.1%	2.0%	0.7%	
I prefer to use InfoTrac over comparable reference tools.	68.6%	19.3%	8.4%	3.2%	2.0%

Time required to search my topic on InfoTrac: [Approximately 15 minutes]

Have you used, or are you planning to use, any of the following other reference tools:

105 *Readers Guide to Periodical Literature*
106 Library Subject Card Catalog
47 *Social Sciences Index*
43 *Business Periodical Index*
Other (please specify) [many]

The results do not vary greatly when looked at from differing perspectives. 75% of those who claimed no prior computer use "agreed strongly" that InfoTrac is easy to use, compared to 86% of those who did claim prior computer use. A somewhat larger difference occurs between undergraduate and graduate student responses to the statement "I found information on my topic using InfoTrac:"

	Agreed Strongly	Agree Somewhat
Undergraduate	68.4%	25.0%
Graduate	51.5%	20.0%

Again, not a surprising result given the popular nature of the database. Comments were solicited at the end of the questionnaire. As the numbers suggest, they were overwhelmingly positive, urging the library to keep "and expand" the system and to "install more terminals." Several users, however, asked to see "more scholarly journals" and "more retrospective information."

INFOTRAC – THE FUTURE

It seems clear enough that our users like InfoTrac. Librarians, even those who feel less enthusiasm than that reflected in this report, are impressed by the level of user acceptance. We do, however, share some strongly felt opinions about future directions.

We are told that we may expect before long a library of databases from IAC. That prospect pleases for many reasons. A nightmare of this developing technology without many standards is that of seven databases requiring seven different equipment configurations. A library of databases will, however, require a "library" of search options. The displayed index approach of InfoTrac is suitable, I believe, for its body of literature and intended users. It will *not* be suitable for a database such as **ERIC**, for example. A full range of search options must be available for those willing to invest the time to learn to use them. A workstation which facilitates access to a commercial databank to search the *same database* in different ways is one option I have heard discussed. It is most definitely *not* a satisfactory solution to this need. If the database I am searching is locally available, on the videodisk, I must be able to get at the information I want locally. I would be willing to move to a remote location only to search a piece of that database not locally available, a piece too recent, or perhaps, too old.

It is critical, I believe, that decisions about which databases to make available accompanied by which search options, not be made on narrowly conceived marketing bases. The full potential of the technology must be exploited. There is, I believe, a willingness – even eagerness – to pay a fair price for products which do just that.

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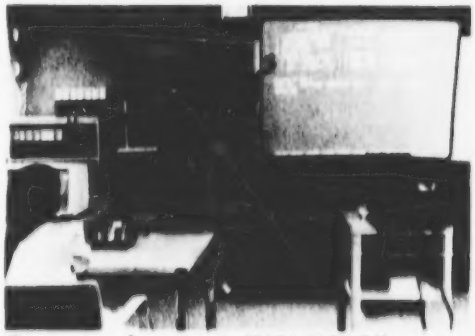
AN INTEGRATED INFORMATION MANAGEMENT EDUCATION PROGRAM...

DEFINING A NEW ROLE FOR LIBRARIANS IN HELPING END-USERS

by Abigail Hubbard, Ph.D.
Director of Education
and
Barbara Wilson
Education Librarian
Houston Academy of Medicine
Texas Medical Center Library



Computer classroom – HAM-TMC Library. Instructor: Abigail Hubbard

Libraries have traditionally been involved in educating their clients about standard information retrieval techniques, but it was not until recently that the librarians involved in instructional programs have come to realize that there is a great deal more to the business of library education than simply course-related information retrieval and orientations on how to use traditional library services. Information management education has evolved to extend the role of librarians in the educational process.

In 1983, top management at the Houston Academy of Medicine – Texas Medical Center Library (HAM-TMC Library) decided to extend and enhance the traditional services already in place and create a new position within the library, the Director of Education. The library's stated goal, informed health care decisions, implied much more than acting passively as an information intermediary. Because of changes in the perspectives of medical schools concerning their curricula[1], the needs of future physicians and other health care professionals, and the challenge issued by the Association of American Medical Colleges (AAMC) to embrace computer technology, a new tool for the health care professional, as an integral part of the medical curriculum[2], it was imperative that the library also respond appropriately. A comprehensive information management education program was one obvious response. This type of program could effectively address the needs of library clients, teaching them the technology, skills, and decision making processes necessary for *independent* information retrieval and management.

With the addition of a Director of Education in May 1984, the library immediately embarked on an aggressive, ambitious education program. The already successful traditional education program in place within the library was reshaped and expanded to include three fundamental components: a formal education program, exemplifying the proactive education role of the library, strengthened traditional instructional programs directed to individual disciplines and student populations, and the classic informal library education that has been taking place in libraries since they opened their doors – the role of the reference librarian in providing not only the necessary information but also an opportunity for library clients to learn how to be successful in seeking information.

THE LIBRARY'S ENVIRONMENT... DIVERSE, MANY CLIENTS

The environment in which the HAM-TMC Library operates was a major factor in determining an appropriate structure for the education program. As the only consortium library in the United States that serves two major medical schools, (as well as three allied health schools, three nursing schools, a school of public

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End-user search station. Searcher: Susan Sprague

health, a dental college, a college of pharmacy, one of the largest cancer research centers in the country, and numerous affiliated hospitals and research institutes), we not only have a diverse, but extremely large clientele (see Appendix A). The library was in an ideal position to provide the Texas Medical Center population with a centralized source of education and training concerning their information management needs. The current structure of the education program evolved because of the magnitude of potential demand for this type of education.

ADMINISTRATIVE CONFIGURATION

The educational services at the Houston Academy of Medicine-Texas Medical Center Library are unique in that they exist as a separate administrative unit, apart from the traditional information or reference services department. Unlike the Information Services Department at the library, the Education Department reports directly to the Executive Director. The decision to configure the Education Department as a separate unit was a philosophical one. Doing so permits designated individuals to deal with administrative issues, such as the development of courses and the management of the program, while permitting the director to utilize the expertise of all the professionals in all departments throughout the library. Professionals outside the Education Department function as an instructor pool and teach as they are needed. The Education Department is in the business of actively meeting the real and perceived educational needs of our clientele, and because demand for educational services is high, using a pool of instructors saves all instructors and notably the professionals in the Education Department, from the possibility of burnout, a frequent problem when only a few professionals are responsible for instruction. An instructor pool also provides greater opportunity for those involved in the administration of the program to (1) obtain additional ideas for development from a variety of instructors and (2) devote time to the operation of the program, i.e., making contacts, improving or updating materials, providing in-house training for instructors, piloting new seminars in-house and participating in committees and projects in the academic community outside the library.

STAFFING ISSUES

Currently, the personnel assignments to the Education Department consist of a director, at full-time status, and a .5 FTE education librarian with a split assignment between the Education Department and the Information Services Department. The instructor pool, however, is large if one considers that all interested faculty members in the library can participate in instructional activities. Currently, our largest regular pool of instructors is drawn from three departments in addition to the Education Department: (1) Information Services librarians (ten individuals), (2) Audiovisual Services librarians (one individual), and (3) Systems librarians (two individuals). The Education Department faculty act as instructors and/or backup instructors when needed. As frequently as necessary, instructors are asked to teach seminars or lead more traditional library orientation sessions. Instructors have developed areas of expertise, such as specific microcomputer applications (spreadsheets, database management systems, online searching), and teach in their specialized area. Their time commitment may range from twice during the academic year to as frequently as once a month, or weekly, depending upon demand for a particular seminar. In addition to actual time spent in the classroom, instructors are asked to participate in the development of new courses and the refinement of existing seminars that they regularly teach.

RECRUITMENT

An assumed role of a librarian at the HAM-TMC Library is that of a teacher. All prospective candidates for faculty positions at the Library are interviewed by the Education Department to determine their interest, previous experience and philosophy of educating library clients. As new faculty members join the library staff part of their orientation consists of several sessions with both the Director of Education and the Education Librarian. Observation of current seminars, classes and tours is incorporated into this orientation period to enable new faculty to better select those seminars they feel qualified to teach. All Information Services librarians participate in tours and traditional bibliographic instruction for both small and large groups. Assignment to these groups is based on subject expertise

and availability. An average time commitment is two hours per week, although this varies throughout the year.

TRAINING

Our experience has been that most librarians are hesitant about participating in this activity called "teaching." Our philosophy in the Education Department is that all librarians can, should, and must teach. Teaching is an activity that is a natural part of most librarians' daily interactions with clients. One training issue is that of helping professionals to recognize those qualities in themselves that contribute to instructional activities. Instructors at HAM-TMC Library are encouraged in several ways. One method is through informal conversations with members of the Education Department both before and after instructional sessions. Strategies and techniques are discussed prior to sessions and a debriefing takes place after the session. The instructor reviews those aspects of the class with which he or she felt most comfortable and satisfied. Strengths of presentation style are emphasized and alternative methodologies are discussed, as are areas for improvement. A second way in which instructors are informed about appropriate methodologies is through informal in-house SDIs regarding teaching methods and learning theory. A file is also kept concerning techniques and philosophies of adult education. Instructors are also encouraged to participate in external workshops such as the Medical Library Association's course, "Teaching Skills for Library Educators."

Internally, the Education Department also trains instructors formally through a series of seminars. The most recent three part series consisted of: (1) teaching the adult learner, (2) developing and conducting a seminar and (3) effective use of audiovisual materials. Introductions to new equipment have also been incorporated into this series as well as procedural policies for class instruction. These seminars are informal and have a discussion format. Participants are encouraged to share problems and helpful tips with each other.

ADVANTAGES AND LIMITATIONS OF ADMINISTRATIVE STRUCTURE

There are both advantages and limitations to the administrative configuration employed in this library. A primary advantage is the ability to draw from a large pool of talented instructors and therefore have content experts teaching all our seminars. A small department of two or three individuals would be much less likely to have all the necessary content

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strengths. With adult learners, it is much more important that we take content experts and teach them how to teach, instead of assuming that a person with expert teaching skills can teach all content areas superficially.

An additional advantage in having a large instructor pool is the diversity it provides in professional positions and the new perspectives gained from a different type of client contact. As alluded to above, too many classroom contact hours can lead to early burnout; with this structure, each instructor has a relatively low teaching load.

A serious limitation in this administrative configuration is a problem of authority and responsibility. While the Education Department is responsible for the development of all education programs, there is a built-in dependency on faculty from other departments to fulfill their role as instructors. Adequate authority must reside in the Education Department for successful implementation of programs. It is also imperative that strong leadership qualities exist within middle managers of the library, and that they embrace the organizational value of the education role of librarians. Cooperation is the primary variable for success in an education program administered under this configuration.

FACILITIES INCLUDE 13 MICROS AND A COMPUTER PROJECTOR

Our teaching lab seats approximately 16-20 people but can accommodate as many as thirty. We limit registration depending on the nature of the content for each seminar. For instance, an optimal number of registrants for a do-it-yourself search class is sixteen (due to the hands-on practice time), while a lecture/demonstration seminar, such as "Organizing Your Reprints Online: IBM-PC" can easily accommodate thirty registrants.

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The teaching lab currently doubles as both a traditional bibliographic instruction classroom and a microcomputer skills lab. Due to demand, we will be expanding into an additional room which will be used solely for bibliographic instruction. This will more easily accommodate set-up for both types of sessions as well as protect the microcomputers from inadvertent damage during non-micro instruction. The current lab is flexibly equipped and arranged. Tables and chairs can be easily reconfigured to create both formal and informal seating groups. Because hands-on micro sessions often demand individualized instructor/client interaction, aisles are wide making each seat and micro easily accessible.

Currently the teaching lab is equipped with five IBM-PC's, one Compaq, and seven IBM compatible Sperry personal computers. The Sperrys are the property of Baylor College of Medicine (BCM) and are being used to train BCM personnel on their in-house system. BCM instructors use the lab three days per week for four hours each day. One IBM-PC is equipped with 640k of memory, a hercules board, and an internal modem. The Compaq also has an internal modem and is used for remote demonstrations. The lab has two dedicated phone lines.

Additional equipment includes an overhead projector, a whiteboard, and a computer projector with a parabolic screen for better image resolution. The computer projector has been especially useful in courses in which the instructor's progress through a software package can be constantly monitored by participants as they practice at their own computers. Often with practicums in which participants have varied levels of expertise, a few participants will get "lost." The computer projector, which always displays the instructor's screen for the group, enables individuals to quickly realize their errors and return to the appropriate screen. The projector is adaptable for use with all of our microcomputers, is portable, and easily transported to off-site demonstrations.

The computer projector has also been a valuable tool in teaching online bibliographic searching classes and for demonstrating a variety of online services for our clients. In search classes an upfront demonstration can help clients to create mental models for concepts presented later, such as the use of Boolean operators, post qualification of terms, free text vs. descriptor searching and basic system commands and protocols.

MATERIALS PRODUCTION

All seminar instructors develop and create the master copies of the materials used in their seminars; they are also responsible for later re-

finements and/or updates. Materials are of two types: (1) registrant packets and (2) classroom instructional materials, e.g., overheads and computer search demonstrations. All seminar materials reside in files on a microcomputer network in the library making them easily accessible to all instructors. If a seminar is taught by a pool of instructors (for instance, "Do-It-Yourself Searching" can be taught by any of nine individuals), the group agrees on the basic materials used. Individuals add teaching examples to the community teaching file for that session. Files are reviewed periodically by the Education Department.

We have found that the use of community materials and teaching files have substantially cut down on duplication of effort by instructors and the time they need to expend in preparation for each seminar or class. Community files and materials also permit the Education Department to monitor materials used in sessions. Although our instructors develop their own materials, the Education Department approves all materials in order to maintain consistency in quality and presentation. Each seminar file consists of original copies of packet materials to be used for photocopying, originals of overheads (paper), teaching overheads (mylar), a set of instructions for the instructor, and a file of relevant background articles. Our entire materials production system has been based on the premise that once the original development phase has been completed, instructors should face minimal preparation each time a session is taught. Similarly, we have developed registrant packets that require a minimal amount of production but which contain a maximum of information. No extraneous materials are included. Each instructor's business card is included in the registrant packet to facilitate later client consultation.

Our registrant packets will soon be included in the ERIC database and will be available through the Clearinghouse on Information Resources.

Our registrant packets will soon be included in the ERIC database and will be available through the Clearinghouse on Information Resources. See Appendix B for topics which may be of interest.

PROGRAM DEVELOPMENT

The initial task undertaken by the Director of Education was a comprehensive needs analysis to determine what types of education programs were in greatest demand, to identify client groups with unmet needs, and to identify gaps in client knowledge of information management skills and strategies. Extensive interviews were conducted with individuals representing the primary institutions served by the library. Also undertaken was a systematic effort to meet with key administrators, faculty committees, and administrative councils. A secondary benefit of these meetings was the opportunity to educate our clients about the new focus of education within the library and to introduce them to the concept of information management education as a necessary and viable fact of life for health care professionals. *A conscious decision was made by the Director of Education to maintain an extremely high level of visibility within the Medical Center as an additional means of focusing on the newly defined, proactive educational role of the library.* Strategies employed included organizing and chairing a medical special interest group of the Houston IBM-PC users group and serving on a task force addressing academic computing in the Medical Center. Local presentations and publications have also enhanced visibility.

A comprehensive information management seminar series evolved over a period of several months. Implementation took place early in the fall of 1984. Due to the immediacy of demand, the first to be developed and formalized was an end-user searching seminar. Additionally, seminars previously offered by the library faculty were expanded and updated. These included an introductory short course for secretaries and research assistants on optimal use of the library, a seminar identifying online options for end-users, and a seminar on organizing a personal reprint file. As seminar content was analyzed and evaluated, and the needs of our clients were identified, modifications were made and new seminars developed. The focus of each of the seminars remained information management, i.e., skills and technologies necessary for efficient acquisition, personal management, and retrieval of information crucial to effective professional performance.

In January of 1985, a comprehensive microcomputer training series was developed to parallel the information management seminars that were in place. These included an introduction to microcomputing concepts, including operation of an IBM-PC, MS/DOS, and representative word processing, database management, and spreadsheet software. All microcomputing seminars were designed to introduce broad concepts and provide information to enable our clients to become intelligent in-

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formation consumers. We do not function as an isolated microcomputer hardware or software training facility, but instead present these seminars as a means to learn the technology currently in place in the information industry, and therefore provide a method for our clients to master the twentieth century tools for information management.

In order to implement the formal seminars quickly in response to client needs, the microcomputing seminars were presented as a seminar series separate from the already established information management seminars. Because the original intent of all of our seminars was, and remains, implementing a comprehensive information management education program, the ordering of these seminars in a logical sequence became a priority. This enabled our clients to select any group of seminars that were of particular interest and integrate a specific portion of our series within their schedules. A complete description of seminars currently offered and the scheduling sequence is provided in Appendix B.

Client response to the seminars was enthusiastic. The program quickly evolved to a totally integrated information management seminar series, with multiple delivery systems to reach our many different client groups and accommodate their organizational structures. The scope of the program is limited by time constraints on the availability of library faculty to teach seminars as well as the availability of appropriate teaching facilities. A five tiered structure now exists, but contingency planning mechanisms can quickly accommodate newly targeted groups.

Open registration seminars

The Education Department has developed a long term schedule for all information management seminars, including microcomputing seminars, and has opened registration to all interested TMC clients. Participants must preregister, although there is no charge to TMC clients. The schedule accommodates the need for participants to fulfill prerequisites prior to attending the seminars of their choice. Seminars are scheduled every Friday afternoon from October through May, except during weeks in which generally observed holidays occur. Because demand generally outstrips available spaces for any given seminar, an additional unadvertised date is scheduled to accommodate overflow capacity, generally the Wednesday following the advertised Friday seminar.

On-demand seminars for student and faculty groups

Both formal and ad hoc groups of students and faculty have requested selected seminars from the information management series to be conducted for their benefit. Microcomputer skills, end-user searching, and reprint file management techniques have been the most frequently requested seminars.

Faculty and staff development programs

Selected seminars have also been integrated in faculty and staff development programs. The library is an active participant in the University of Texas Task Force on Academic Computing Computer Skills Workshop Series, offering end-user searching and reprint file management seminars under their aegis. Hermann Hospital (a University of Texas affiliate teaching hospital) nursing managers and head nurses have both requested information management seminars be presented as part of their formal staff development programs. An additional example is the inclusion of information management skills in Texas Woman's University faculty development colloquia.

Curriculum-based information management education

Information management skills have also been formally integrated in the curricula of several institutions in the Texas Medical Center. An introduction to the value of information management skills, as well as basic techniques necessary for information retrieval, is presented to the freshman class at the University of Texas Medical School as a module of a required course. Students complete the information management component of this class through a formally evaluated project and class presentation. Selected seminars from the information management series have also been formally accepted in the curricula of courses within the School of Public Health, University of Texas School of Nursing, Texas Women's University School of Nursing, and the U.T. School of Allied Health. Curriculum-based information management is a high priority within the HAM-TMC Library education program. Contacts with faculty who attended both open registration and on-demand seminars invariably lead to requests to provide information management seminars for their students, many of these being formally incorporated as part of the curriculum.

Grand Rounds

Baylor College of Medicine residency program directors have also incorporated selected information management seminars as part of the general informational Grand Rounds presentations. The greatest demand is for end-user searching skills and reprint file management seminars. Grand Rounds provides one of

the few opportunities to interact with residents due to their heavily encumbered schedules.

MARKETING. . .MULTIPLE STRATEGIES NEEDED

Marketing is a key element for an independent education program to be successful in a library environment. Our clientele are dispersed among twenty organizations; therefore, it became necessary to develop multiple marketing strategies for each client group. We advertise all seminars in the library's monthly newsletter, *New Titles and News*, as well as posting notices about upcoming seminars within the library. We frequently use mass distribution of flyers to announce a particular seminar. These flyers are sent to specific target groups depending on the nature of the seminar, and are placed in mailboxes within institutions throughout the Medical Center. We are fortunate to have a central mailing facility and a courier service that willingly advises us of groups we may want to consider for specific mailings. Other avenues include distributing flyers to the other libraries in the Medical Center, broadcasting notices on the UTTV electronic bulletin board, announcements in institutional newsletters, and direct marketing to faculty and student groups. We have also found that personal recommendations have been an effective means of advertising our program. As stated earlier, a faculty member who attends one of the open registration seminars will later request a similar seminar for a group of colleagues or students.

We maintain a cautious posture when marketing because we could quickly become a victim of our own success and have demand exceeding our ability to deliver. We attempt to target client groups with specific needs.

We maintain a cautious posture when marketing because we could quickly become a victim of our own success and have demand exceeding our ability to deliver. We attempt to target client groups with specific needs. We also make a conscious effort to identify client groups within each major organization for whom we have appropriate educational opportunities. There remains a vast untapped market within the Medical Center for the types of educational opportunities offered by the library.

EVALUATION

The education program is dynamic and constantly evolving. This process is facilitated by the feedback and evaluation loops built into the management of the program. Each seminar is evaluated by participants, with separate criteria for content attributes and instruction. Additionally, each instructor is evaluated and provided with immediate feedback after each teaching experience. Formative evaluation techniques provide an effective mechanism to constantly change and build the program and respond to client needs.

MANAGEMENT CONTROLS

As with any large and growing program in an organization, there are numerous management functions that must be maintained and monitored. Data are collected and analyzed that provide valuable information useful in planning instructors' participation rates, analyzing the needs of specific institutions, identifying institutions or client groups not being reached by the education program, and establishing a time series whereby peak activity levels can be predicted. Spreadsheet software (Lotus 1-2-3) is used to maintain these files and produce monthly and annual reports.

IMPLEMENTATION CONSTRAINTS

There is little doubt that the introduction of a drastic program change such as this has profound effects on an organization. In the case of our education program, decisions were made and changes implemented within a few short months after the creation of the Education Department. This meant disrupting the status quo and required many professionals to visualize the role of the librarian from a new perspective. John Gabarro, writing in the Harvard Business Review, provided interesting data about how a new manager takes charge within an organization, and identified the tasks and problems encountered. The model he developed that identifies a typical pattern of action by a new manager parallels the experiences at our library when this new program was introduced. Gabarro's model identifies five steps all new managers take: orientation, evaluation, and corrective action; immersion; reshaping; consolidation; and refinement. It is evident through analysis of the progress of our education program that we are in the reshaping stage, and beginning the consolidation process. As these changes are accepted within our organization, a more refined educational product is produced. ►

THE FUTURE ... A NEW ROLE FOR LIBRARIES AS "ACTIVE LEARNING CENTERS"

Successful introduction of an integrated information management education program in any library will have profound effects on the types of services offered by the library in the future. Once such an expansive educational program is institutionalized within the medical center or academic environment, client expectations increase. Clients recognize the increased opportunities available to them and begin to see the library role from a new perspective. The library becomes a place to learn as well as seek information; the library ceases to be a repository and becomes an active learning center. Implications within the library are also potentially profound. Adjustments must be made in the priorities previously defined for public service functions. Professionals must adopt a new role in addition to fulfilling their traditional functions. Values must be reshaped. We are succeeding in accomplishing these objectives at the HAM-TMC Library. Flexibility, adaptability, a cooperative spirit, and a common bond in working synergetically are helping us accomplish our goals in bringing to our client population an educational program that will equip them to function independently in the information age.

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APPENDIX A

HOUSTON ACADEMY OF MEDICINE – TEXAS MEDICAL CENTER LIBRARY

Participating Institutions

Baylor College of Medicine
Houston Academy of Medicine
Texas Medical Center, Inc.
Texas Women's University
The University of Texas Health Science Center at Houston
The University of Texas System Cancer Center

Supporting Institutions

Harris County Hospital District
Hermann Hospital
Houston City Health Department
Institute of Religion
The Institute for Rehabilitation and Research
Memorial Hospital System
The Methodist Hospital
Prairie View A&M University College of Nursing
Shriners Hospital for Crippled Children
St. Luke's Episcopal Hospital
Texas Children's Hospital
Texas Research Institute for Mental Sciences
University of Houston College of Pharmacy
Veterans Administration Medical Center

APPENDIX B

Seminar Descriptions and Sequence

GOING ONLINE: CHOICES
Provides an overview of the many databanks and types of databases available for individuals interested in doing their own searching.

DOING YOUR OWN DATABASE SEARCHING
Provides a practical introduction to online bibliographic retrieval, including an introduction to the BRS Colleague system, emphasizing search strategy development, system protocols, and hands-on experience.

GATEWAY SOFTWARE
Introduces participants to the many "user friendly" interfaces that have been developed for end-user searching, including SciMate Universal Searcher, InSearch, and gateways for multiple databank access.

COMMUNICATION SOFTWARE
Intended to provide participants with knowledge to make a choice about which communications software package they prefer. Includes technical data about protocol specifications and demonstrations of several popular packages.

ADVANCED DATABASE SEARCHING TECHNIQUES
Targeted to individuals trained in the basics of online searching, this seminar examines MeSH in detail, interactive tricks and tips, subheadings, and narrowing and broadening search strategies.

DOWNLOADING
Provides guidance in the mechanics of downloading data from databanks to per-

sonal disk files and subsequent manipulation of those files.

FULL-TEXT DATABASE SEARCHING TECHNIQUES
Identifies strategies for successful full-text searching, including appropriate search parameters and techniques.

ORGANIZING YOUR REPRINT FILES
Provides an overview of the decisions that must be made in establishing a manual reprint file system, including vocabulary control.

ORGANIZING YOUR REPRINT FILES ONLINE: IBM-PC
Examines criteria for evaluation of software packages developed specifically for reprint file management using an IBM-PC, including demonstrations of sample files.

ORGANIZING YOUR REPRINT FILES ONLINE: APPLE
Same as for the IBM-PC, above, except packages developed for the Apple computer are examined and demonstrated.

DATABASE MANAGEMENT SYSTEMS
Introduces participants to the structure of computerized data files using lower end database management systems (e.g., PFS File); hands-on experience in creating a file is provided.

SPREADSHEET APPLICATIONS
Introduces the concept of electronic spreadsheets, identifying alternate applications for spreadsheet packages useful for information management.

ELECTRONIC MAIL AND BULLETIN BOARDS
Currently under development, this seminar will provide participants with information regarding the availability and use of electronic mail and local and national computer bulletin boards.

INTRODUCTION TO MICROCOMPUTING: IBM-PC
Familiarizes participants with terminology, concepts, hardware, and software options in microcomputing, with an introduction to the IBM-PC and MS-DOS. (Completion of this course or experience with a microcomputer is a requirement for many of the above seminars.)

INTRODUCTION TO WORD PROCESSING
Acquaints participants with the concept and capabilities of word processing software packages, knowledge necessary to manipulate data downloaded from databanks and interface with other software. (Completion of this course or experience with word processing packages is a requirement for some of the above seminars.)

ADVANCED DOS
Currently under development, the intent of this seminar is to teach subdirectories, batch files, and other more sophisticated DOS functions.

THE AUTHORS

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BARBARA WILSON has a split assignment at the Houston Academy of Medicine–Texas Medical Center Library, serving .5 FTE as Education Librarian in the Education Department and .5 FTE in the Information Services Department. A professional educator, she received her A.M.L.S. from The University of Michigan in 1983.

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END-USERS: HOW ARE THEY DOING? A LIBRARIAN INTERVIEWS SIX "DO-IT-YOURSELF" SEARCHERS

by Natalie Kupferberg
Brooklyn College Library

Professionals who conduct their own online searching say that they're doing just fine.

- A Brooklyn psychologist is "thrilled" because research which used to take five hours now takes ten minutes thanks to Bibliographic Retrieval Services.
- A Queens educator utilizes ERIC to keep up with the latest material in his field and also to search questions that come up in his work.
- An administrative assistant at Cornell University Medical College provides answers to neurosurgeons by searching Medline through the National Library of Medicine.
- Chemists at a Connecticut company regularly utilize DIALOG to save time and improve efficiency in their research.
- Two New York labor lawyers find they can get the necessary "dope" on arbitrators and judges before arguing a case by searching on LEXIS.

So far the actual number of patrons who have learned to do computer searching themselves remains small, although many others have expressed the desire to do so. One study estimated that while 71% of physicians are interested in doing end-user research, only 8% are actually doing their own.[1]

I talked to people in a wide variety of fields who have taken the plunge to see how they like this novel approach to doing research.

THE WORLD AT HIS FINGERTIPS

Paul Bindler is a research associate at Beth Israel Medical Center, a clinical instructor in psychiatry at the Mt. Sinai School of Medicine, and a psychologist in private practice in Brooklyn. He has access to BRS/After Dark, BRKTHRU, The Source, and CompuServe. He has two computers – an Apple II and a Radio Shack Model 200 with a built in modem which is portable. There are two reasons why he searches; one is for research and the second because he feels he has the "world of information at his fingertips" and there are a lot of things he is just plain curious about.

His research questions have been on such things as minimal brain dysfunction in adult schizophrenics or cultural differences in the utilization of psychiatric services in hospitals. Obviously, the databases he uses most often are Psychological Abstracts and Index Medicus. But when he does what he describes as playing with information, he also searches the religion database, economic and business databases, and the education databases.

Dr. Bindler loves to search. "I remember the nightmare as a student of spending five hours going through Psychological Abstracts. What I did in five hours I can now do in ten minutes to an hour. . . Even though I had no money as a student, I still think I would have made some effort to buy a computer just for its word processing capabilities and to do online searching."

[1] Poisson, Ellen H. "The Present Status of End-user Searching in Medicine," Paper presented at the annual meeting of the Medical Library Association, New York, NY, 27 May 1985.

Left to Right: Chester Lemanski, Debbie Fitzgerald and Richard Morris comparing notes for a search at the Ensign-Bickford Company in Simsbury, CT.

Although Dr. Bindler finds online searching a great timesaver, he is less sure about its improving the quality of his research. "When I did my searches manually it was rare that I missed an article. I was very thorough. I would check through the abstracts, get the articles, check the references at the end of the article and then do a citation search." Now he feels he might be missing articles but he added that might be because he isn't as efficient in online searching as it is possible to be. "I also don't know enough about how the databases are constructed to know where my inadequacies end and the databases begin. In other words, I'm not sure every article is indexed to its fullest potential."

Dr. Bindler experiences the same frustrations as "professional searchers." Why don't some articles show up? Why do some irrelevant articles show up? He does feel that with time and experience he is getting better results.

Except for one computer course taken as a junior in high school, Dr. Bindler is completely self taught. He discovered what database searching was from reading computer magazines. The actual trigger to do his own searches came from a psychiatric resident who brought in printouts from his own computer. Dr. Bindler says, "I realized that what was being done in libraries could now be done at home." He is looking forward to the day when he will not even have to go to the library to get the articles but will just request them through the computer. He is currently investigating the services of University Microfilms International Clearinghouse.

However, librarians needn't despair. He still needs to go to the library to search for older materials and even to take out books. What he is really waiting for is the day "when you can print out the entire article on the computer."

Dr. Bindler believes that database searching is a skill everybody should have. "A five year old can start playing with a computer. By the time those five year olds are twenty, computers will be as integrated into their lives as telephones. Computers should be a natural occurrence. They should be fun and entertaining, not anxiety provoking, and the earlier the exposure the better. If you are in favor of education, this is another tool to enhance learning."

TO EACH HIS OWN. . .A MICRO FOR EVERY FAMILY MEMBER

One family where the children have grown up with computers is that of Neal Ehrenberg. Mr. Ehrenberg has been in education for twenty-three years, having started as a math teacher. Today he works for the New York City Board of Education and is in charge of training teachers in the use of computers in grades K to 12 in the Borough of Queens.

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To keep his family from fighting to use a computer, he has seen to it that every member has one. His sixteen-year-old has an Atari, his fourteen-year-old a Commodore 64, his wife and he share an IBM PC, and the entire family also has use of a portable computer. He considers his children lucky because "they have been involved since they were in the second or third grade—by the time they were in junior high they were sophisticated users."

At first Mr. Ehrenberg told me that he didn't know what his kids do on their computers, but when pressed he said that they use it because they are "too lazy" to go to the library. He remembered one instance last year when his son, who was doing a report, searched for references on the computer, called the library to see if they owned the journals, took the portable computer to the library to take notes, transferred the notes to the computer he was using at home via the modem, and then "dumped it all into his word processor." Mr. Ehrenberg added that although it cost him $15 to do the search it was worth it because he didn't have to drive his son around to the libraries.

Mr. Ehrenberg thinks all children should start using the computer by the time they are in the fourth grade. At that time they can start using word processing to write their reports and can also use spreadsheets for their science projects. For database searching, he thinks it's best that they go to the school librarian who can help them narrow down the topic and then actually perform the search. "The process of narrowing the topic is the same whether done manually or with a computer, and I think it's generally easier for a student to learn the concept of Boolean logic with a computer search. That way they can immediately see how many entries there are and know they must narrow their topic."

For his own work, Mr. Ehrenberg has access to the education databases through BRS/Educator. Like Dr. Bindler, he is self taught and confessed to being someone who loves to read manuals. He remembers the first time he had a computer search done through a major university. "It took a week for the appointment, another for the results, and when I got it back it wasn't exactly what I wanted anyway. I am sure librarians' skills have improved and the service is more rapid, but I reached the point when I said that my time is worth something and what it costs me is much less than what I think my time is worth."

Mr. Ehrenberg didn't search ERIC manually because it wasn't worth the time and effort to travel to the nearest library. Now that he can just sit down with his computer at home he keeps up-to-date with what is happening. "If you are involved in teaching and staff development you must know what is new in the field," he said.

This educator, who has been doing online searching for three years, thinks you get much better results than by searching manually. "The only advantage of a manual search is that while you are searching one thing something else may catch your eye, but I'm not sure that the time you spend doing the manual search is worth the occasional jewel you may miss."

Researchers and professionals consider their time very valuable; so many would probably like their assistants to be trained in online searching. One place where that has happened is in the department of neurosurgery at Cornell University Medical College.

A MATTER OF KNOWHOW

Researchers and professionals consider their time very valuable; so many would probably like their assistants to be trained in online searching. One place where that has happened is in the department of neurosurgery at Cornell University Medical College. Lucy Gruber has been an administrative assistant there for three years and has worked in hospitals and medical centers for thirteen years. In that time she has picked up a lot of medical terminology. About three years ago the department of neurosurgery purchased a terminal with a modem and printer and decided that as long as they had the equipment they would learn how to search. Ms. Gruber and some of the interested physicians took the Medlearn tutorial from the National Library of Medicine and also attended lectures given by Doris Lowe, the librarian who was the head of reference at Cornell for twenty years. In addition to searching through NLM, they are now considering obtaining access to BRS/SAUNDERS Colleague.

Ms. Gruber said that the attendant physicians give her their questions while the residents will often attempt to do their own searching with what she feels are "varying degrees of success." She has searched such questions as *the relationship of hypotension and focal cerebral ischemia* and the *comparison of two different types of surgery on pituitary tumors.* The patrons usually are not present when she performs the search.

Ms. Gruber finds that the doctors are usually

satisfied with a few good articles. "It gives them something to start with and those few good articles will usually lead to more." One reason Ms. Gruber feels that the residents may not always be as successful in searching is because they often search just with textwords and do not use the controlled vocabulary, which is an essential part of Medline. She told the story of one resident who was doing a search on Z-form DNA structure. He tried the search himself on NLM and did not come up with anything. He then had the library do the search and was given a list of articles. He was convinced the library had succeeded because they did the search on BRS. Ms. Gruber came up with the same list of articles when she searched the topic on NLM.

Like Dr. Bindler, Ms. Gruber sees the computer as a big timesaver and is less sure about its improving the quality of the research. For an absolutely thorough search she feels a person should do the search manually as well as on the computer.

Ms. Gruber recommends computer searching to everyone and feels it's easy to learn and also fun. "Dealing with the computer is like playing 'Mother, May I?' You just need to word your question appropriately to get what you want."

"CHEMISTS ARE LIKE ARTISTS"

Not everyone agrees that students should learn to do online searching as early as possible. Richard Morris, a chemist at the Ensign-Bickford Company of Simsbury, Conn., believes that "Chemists should wait till they are actually working in industry to learn how to search. In college and graduate school they should do their searching manually and should learn how the printed Chemical Abstracts is set up. Otherwise it's the equivalent of using a calculator without learning math."

About three years ago the Ensign-Bickford Company, which manufactures and markets explosive systems, decided they would subscribe to DIALOG to help them do research. The company asked Debbie Fitzgerald, who had been doing mainly administrative work, to learn online searching. Today she has the title "literature specialist." Several months ago the company also decided that the chemists themselves should do their own searching since they had the necessary chemical background.

Chester Lemanski, an Ensign-Bickford chemist, said they are usually trying to find out how a chemical is made and what the synthetic route is for its preparation. "If I make a new explosive I want to make sure it's patentable." Before he knew how to search Chemical Abstracts online, Mr. Lemanski did the searches manually. Researchers had to go to the University of Hartford if they wanted to use cumulative indexes. The research took two or three days. Most of the searches now take from a half-hour to forty-five minutes.

Before he knew how to search Chemical Abstracts online, Mr. Lemanski did the searches manually. Reseachers had to go to the University of Hartford if they wanted to use cumulative indexes. The research took two or three days. Most of the searches now take from a half-hour to forty-five minutes.

Mr. Lemanski, who has been doing his own searching for about two months, thinks all chemists working in industry should know how to search. He agrees with Mr. Morris that students should not start searching until after they get their degrees. "Chemists will appreciate more what the computer can do if they have searched Chemical Abstracts manually."

Debbie Fitzgerald observed: "Chemists are like artists to me. When they develop something they have a great interest in it and they love to talk about it. I'll listen and I have picked up an awful lot of chemistry that way."

Ms. Fitzgerald has mixed feelings about chemists doing their own searching. She believes they should all know it exists and also know how to access it, but believes that to do their own searches they may be better off by going to someone who searches constantly. "It takes a lot of time to remember the mechanics of searching and one half hour with me may save them two hours of their time. I think they should go to the training primarily so that they can come to me with the correct questions so we can help each other. If you don't use it constantly you lose it."

Ms. Fitzgerald says that because of online searching different divisions at Ensign-Bickford can keep up with what the other divisions are doing. Before online searching one division was duplicating the work of another. "We now have better communication within the company and it all starts with DIALOG."

SEEKING LEGAL AID

Jean Grumet is the assistant general counsel for the Amalgamated Clothing and Textile ►

Workers Union. One time she wanted to quote in her brief the definition of *chutzpa* "as a person killing his parents and pleading for mercy on the grounds that he was an orphan." Before doing so she wanted to see if a judge had ever cited this definition. She found that one had in LEXIS and says that "it would be impossible to do this research without a computer. You can't look up *chutzpa* in any manual indexes."

Ms. Grumet was a litigation paralegal for a Wall Street law firm. She first had done some legal research manually and the company knew she was interested in going to law school. She was one of the first people in her company who received computer training, and was immediately given increasing responsibility.

While in most disciplines, the main advantage of online searching is to save time, in law there is some research that absolutely requires a computer. Seth Kupferberg, the assistant general counsel for the International Ladies Garment Workers Union, said it was important to know the past decisions of a judge when arguing a case before the National Labor Relations Board. "With LEXIS you are able to see what other decisions this judge has made. Otherwise you would have to go through every single case and there could be 200 volumes of cases. Since the database only goes back to 1972, before that time you just did without the decisions that the judge had made."

Mr. Kupferberg and Ms. Grumet also use NEXIS in their work. Mr. Kupferberg does volunteer work for the Center for Immigrants' Rights. One time he was trying to defend the rights of an immigrant from El Salvador who was seeking political asylum in this country. His client had lived near a bridge where he woke up each morning to see the bodies of people who had been hung the preceding night. Mr. Kupferberg put the name of the bridge into NEXIS and came up with information about it that helped in his investigation. You cannot search by the names of minor bridges in the New York Times Index.

Ms. Grumet says searching LEXIS is like doing an algebraic equation. "Knowing where to put your *ands* and *ors* is like putting your parenthesis in the proper places." In school she did well in algebra (although she quickly added she was terrible in geometry), and thinks there may be a correlation to doing well in algebra and in searching LEXIS efficiently.

Neither Mr. Kupferberg nor Ms. Grumet believe that every lawyer should go out and purchase a LEXIS terminal. Ms. Grumet said, "For a criminal lawyer it would be useless. . . They argue to juries and base their arguments on the facts of the cases, but anyone who argues to a judge and bases his arguments on precedents would use it."

Mr. Kupferberg and Ms. Grumet approve the fact that almost all law schools now require their students to learn how to search LEXIS. Like most of the other searchers I talked to, they said for an absolutely thorough job you really need a manual as well as an online search.

THE VIEW FROM THE LIBRARY

All the searchers I interviewed enjoy doing their searches and appreciate searching mainly because it is a big timesaver. Although not all were so sure that it improves the quality of their research, the more experienced the searcher the greater his or her confidence was that they were not missing many items. None rely heavily on librarians to help them with their strategies after their initial starts.

As a librarian, there is only one thing that worries me about end-user searching. All of the searchers spoke of their delight because they now have to spend less time in the library. Two implied that they can't wait until they won't have to spend any time in the library at all. Will research eventually suffer because of this? Don't libraries have an element to them that no databases or even entire journal articles printed on a computer can replace? I find these are troubling questions, and I hope that successful end-users do not abandon libraries completely.

THE AUTHOR

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Identifying And Informing The Potential End-User: Online Information Seminars

by Linda Friend
Database Search Service Coordinator
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Libraries

INTRODUCTION

Faculty and graduate students at most colleges and universities have become increasingly interested in online access to information in recent years. With the advent of such user-friendly systems at BRS/After Dark and DIALOG's Knowledge Index, reference librarians at the Pennsylvania State University decided it was crucial to begin to share information on the array of database searching alternatives in a more organized manner. Collegiate faculty in particular had begun to ask about the feasibility of running their own searches at the library and many were also interested in learning more about individual contracts with various databanks.

Therefore, in the summer of 1983 the Search Coordinator began planning seminars with the Health Science Librarian based on two related purposes: to inform faculty and graduate students in particular about the activities of the library's fee-based search service, and to explain the various individual subscription alternatives available to microcomputer owners for running their own searches. The following objectives were identified as paramount:

1. Identify computer-knowledgeable individuals in the University community and assess their level of activity as users or potential users of commercial databanks.
2. Raise the University's awareness of PSU librarians' expertise with online information retrieval.
3. Begin to develop a healthy consultant relationship between the libraries' experienced searchers and end-users (who may be people not regularly served through the library).
4. Begin to measure the need for more/other types of instruction in online information retrieval.
5. Teach end-users how to decide when it is profitable to search themselves and when to seek a search intermediary (librarian).
6. Publicize activities of the libraries' search service and make contacts useful in the managment of that service.
7. Increase our own knowledge of personal computer usage from end-users' experiences.

Since librarians had been receiving steady requests from individuals who wanted actual training by library staff in either DIALOG or BRS (most without having any idea of the complexity of database searching or the time in-

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vestment involved), the Search Service Coordinator also wanted to determine if BRS/After Dark or Knowledge Index could offer a reasonably priced, relatively effective way for these individuals to gain access to online files for their personal research needs. Also, librarians were interested in finding out if these potential end-user searchers wanted to "go it alone" or would prefer to use the library's facilities, manuals, equipment, and passwords, with experienced searchers on call.

SESSION PLANNING

Since the Coordinator's searching expertise is strongest in the social sciences, each session has been planned and taught with an experienced searcher from the Science and Technology Department, the Health Science Librarian. Having two librarians share responsibility turned out to be an excellent idea. Two delivery styles added some interest to the actual sessions, and expertise could be pooled. It is always valuable to have two people available during online demonstrations, one to type examples and operate the equipment, the other to interpret the results of search strategies as they are displayed.

In planning the sessions, it appeared that about three hours would be necessary to cover all topics on the session outline (Appendix A), including an opportunity for demonstration and some hands-on experience by attendees.

Having two librarians share responsibility turned out to be an excellent idea. Two delivery styles added some interest to the actual sessions, and expertise could be pooled.

PUBLICITY

In order to reach the most highly motivated audience, descriptive flyers were sent to faculty members known to be interested in information retrieval (or who had personal computers) about three weeks before the scheduled session; librarian colleagues also suggested names for the mailing list. Two weeks before the session an article was inserted in the *Intercom*, the university's weekly newsletter for full-time faculty and staff. Announcements went out to the various local microcomputer user groups and selected academic departments for posting or dissemination through electronic bulletin boards. Since there were no plans to cover microcomputers or software se-

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ONLINE Magazine – Regular subscription (6x year) . . . . . $78/yr. (U.S.)

DATABASE Magazine – Regular subscription (4x year) . . . . . $56/yr. (U.S.)

Individual subscription (paid by personal check or credit card) mailed to home address: ONLINE . . . . . $39/yr. (U.S.); DATABASE . . . . . $28/yr. (U.S.)

800-824-7888 (Operator 982) Toll Free

lection in any depth, the session leaders wanted to make certain that any publicity mentioned this caveat, as well as the fact that concentration would be on commercially available databases; attendees would hopefully come with realistic expectations if the purposes of the session were clearly stated, and not demand that librarians provide detailed hardware or software consultation.

REGISTRATION

Based on previous classroom experiences, 30 people seemed to be the maximum that could be handled in a single session, so all attendees were required to preregister. The reference department's secretarial office handled phone registration for the first session and it became a real burden since the phone rang incessantly for days; for subsequent sessions the session leaders turned to mail-in confirmation, which appears to be working well. Obviously a definite need for information existed on campus: the first 30 places were reserved in a matter of hours, and two more sessions had to be scheduled that first semester for the overflow.

Preregistration is valuable for other reasons besides assuring space in the classroom for all attendees. By requiring everyone to submit a pre-session questionnaire, the session leaders knew in advance which subject areas were represented, how many in the group felt they were knowledgeable about personal computers, and other information that would help the librarians tailor the presentation and demonstration examples accordingly.

PRE-SESSION QUESTIONNAIRE

Individuals were asked to respond to six questions (see Appendix B for form), and 72 total responses have been submitted for the five sessions conducted so far (approximately 80 individuals have attended the sessions but not everyone returned the pre-session questionnaires). Forty-four attendees were faculty (61%), 17 were staff members (24%), and 11 were graduate students (15%), and they came from many different disciplines including mathematics, chemistry, microbiology, physiology, engineering, business, agriculture, education, health planning, and psychology. As far as databases of interest, most were curious about databases in general (80%) and many also checked several other categories or added categories of their own (Table 1). Registrants were also asked to identify their main reasons for coming to the sessions, and their responses indicated to the librarians that "the basics" would be necessary (Table 2). Several individuals remarked in their comments that they wanted to expand what they could do with a personal computer, and a number were investigating databanks for possible departmental accounts. Only seven individuals actually had accounts prior to the session (3 with DIALOG, 2 with NLM, 1 with BRS/After Dark, and 1 with Dun & Bradstreet), although many among the attendees were considering them (Table 3).

The librarians were also interested in assessing whether potential attendees owned the requisite equipment for searching, and how comfortable they were with computers and databases. Thirty-two said they owned personal computers (although several indicated lack of a modem), 31 had access to a personal computer or interactive terminal, and only 9 individuals lacked access to hardware. The librarians found it very illuminating that only 12.6% of the attendees did not have hardware available either in the office or at home, and future studies will probably see this figure declining even more. Most individuals considered themselves to be "novices" in the field (53, or 73.6%), eighteen people felt they were "moderately experienced (25%), no one felt "very experienced," and one person declined to answer.

The librarians made considerable use of the information provided in these registration questionnaires, and were happy to see that individuals seemed to be coming to the sessions for the right reasons and were not expecting hardware-specific or extremely detailed topics to be addressed. Once individuals had identified subject areas of particular interest, the librarians were able to choose relevant online demonstration topics and examples for the lecture in advance.

TEACHING THE SESSIONS

Librarians have generally followed the basic outline for each session (Appendix A), although they have experimented with placement of the "break" and demonstration. The lecture periods should last about 45 minutes to one hour at a time and be punctuated with question and answer periods, work with prepared charts or illustrations on the board (e.g., for Boolean logic), demonstrations, or opportunities to "stretch." Sample manuals, thesauri, and databank contracts were provided for attendees to examine during the "break," and many took this opportunity to ask the librarians questions of a specific nature. One suggestion was made to talk about advantages and limitations earlier in the presentation and the next sessions will incorporate that idea; the individual making the suggestion felt it would help people solidify their thoughts at an early stage. Each attendee received a substantial packet of information (another reason for requiring advance registration), presented in a colorful folder to help em-

►

phasize the professional seminar impression the librarians were hopeful of achieving. Materials have varied somewhat but usually include: database and databank specific information; charts produced in-house on cost comparisons, appropriate/inappropriate topics for online searches, and equipment interface requirements; brochures and forms for the Search Service; and a sheet of sources of further information, "hot lines," etc. Every databank contacted has been most generous in providing both printed materials and advice on request.

POST-SESSION QUESTIONNAIRE

During the demonstration at the end of each seminar, a second questionnaire (Appendix C) was distributed to gauge reactions to the presentation and help identify areas for improvement of the sessions as well as potential new services. Sixty-three people returned these questionnaires and many offered helpful comments.

In response to a question about whether the session covered what the attendee expected, 60 people said yes, one said no, and two did not answer. The session length was considered "about right" by 50, "too long" by six, and "too short" by five attendees (again, two did not comment).

There was no unanimity about which parts of the presentation were most valuable, so all have been retained in the outline (Table 4). Fewer people commented on which parts of the session were less valuable, and many penciled in that all topics were useful and necessary (Table 4). The results are certainly subjective but indicate that attendees came with many different needs for information: some were obviously ready to sign on with a databank and wanted specific information on costs and search techniques, while others were simply exploring the possibilities. The outline of search techniques was actually considered to be the least valuable part of the presentation by 27 people, leading to an assumption that many attendees did not need too much detail at this stage and wanted general information.

The outline of search techniques was actually considered to be the least valuable part of the presentation by 27 people, leading to an assumption that many attendees did not need too much detail at this stage and wanted general information.

About half of those who took part in the sessions plan to investigate one or more options further (Table 5), and several indicated that the addresses and toll-free numbers provided would be useful in the future.

FUTURE PLANS

Many questions need to be addressed about the future role of the librarian. At Penn State we feel that librarians are in a unique position to provide information through electronic sources, just as we have been providing information in many other formats as technology makes them available. Instruction in the use of databases seems to be a logical "next step," and several questions on the Post-Session Questionnaire attempted to gauge what this admittedly limited sample of faculty, staff, and graduate students felt about the library's responsibility in this area. The results will be considered as we move toward a redefinition of the librarian's place in our academic community.

Individuals were asked if the library should offer a formal or informal consulting service for individuals on campus who are personally using external databases, and 57 answered yes, five were undecided, and only one felt it was unnecessary. When asked if the library should consider offering formal training in online searching, 43 answered yes, 15 were undecided, and only five felt it was inappropriate or unnecessary. Several people commented that if training were offered, each individual should help to bear the costs involved. Obviously many of our colleagues feel that such activities would be a logical extension of the library's present consultative and instructional functions. When asked if a user group should be formed on campus for people interested in searching, 29 said yes, 31 were undecided, and three felt it was not necessary, so the organization of such a group may be somewhat premature.

There are also plans to offer more detailed seminars in specific subject areas, beginning with business databases, since 51 of the 63 people answering the Post-Session questionnaire stated that they would attend advanced sessions if available. A wide variety of subject areas and specific databases were requested, including: architecture, biomedical research, U.S.-Soviet relations, government publications, education, mathematics, forecasting and social trends, business and marketing, environment, agriculture, philosophy, art history, microbiology, family studies, finance, and literature. One person added a lighter note by re-

questing humanities databases and adding, "Now, isn't that a challenge?"

CONCLUSION

These seminars have been a stimulating and worthwhile challenge for the librarians involved. Besides allowing important information to be disseminated, these contacts with students, faculty and staff have begun to produce an increasing respect for the librarian as a professional colleague.

TABLE 1 – DATABASE INTERESTS FROM PRE-SESSION QUESTIONNAIRE

58	Databases in General	8	Psychology
18	Medicine/Health	8	Journalism/News
14	Biosciences	3	Patents
10	Engineering	12	Grants
10	Business	27	Government Reports/ Publications
3	Earth Sciences	19	Other: anthropology, materials science, microbiology, agriculture, personal computer indexes, social sciences, mathematics, statistics, ergonomics, arts and theater, chemistry, etc.
16	Humanities		
7	Education		

TABLE 2 – REASONS FOR ATTENDING SESSION

#1 Priority	#2 Priority	#3 Priority	Total		
53	9	5	67	. . .	To gain knowledge of potentials/limitations of bibliographic databases
9	34	4	47	. . .	I plan to use the library search service and want to learn more about it
6	10	13	29	. . .	I plan to use (or already use) one of the systems such as DIALOG personally
3	3	0	6	. . .	Other

TABLE 3 – DATABANK ACCOUNTS UNDER CONSIDERATION, PRE-SESSION

Planning to get an account?	18 Yes 6 No 41 Undecided 7 Presently Have Account
Which databank, if known?	3 DIALOG 1 DIALOG's Knowledge Index 3 BRS 4 BRS/After Dark 7 National Library of Medicine 0 SDC 3 ISI 3 Other (all CAS Online)

TABLE 4—MOST OR LEAST VALUABLE PARTS OF SESSION

Most Valuable	Less Valuable	
35	5	Description of available databanks
29	10	Description of available databases
27	22	Outline of search techniques
26	2	Outline of costs
22	7	Outline of advantages/limitations
30	1	Demonstration
10	17	No answer

TABLE 5—DATABANKS UNDER CONSIDERATION, POST-SESSION

Do you plan to investigate any databanks further:
29 Yes
2 No
31 Undecided
1 No answer

If so, which databanks:

7 BRS
23 BRS/After Dark
7 DIALOG
12 DIALOG's Knowledge Index
0 SDC
4 ISI [a databank during part of the study]
6 NLM
6 Other (Sci-Mate, CompuServe, CAS Online, H.W. Wilson)
10 Penn State's Search Service

APPENDIX A
"USING PERSONAL COMPUTERS FOR INFORMATION RETRIEVAL: A CONSUMER'S GUIDE"

Introduction: Welcome; objectives; session overview; ground rules

I. Definition and History of Online Information Retrieval

A. Functional definition of online searching
B. Brief History and Development

II. Some Databanks and/or Database Producers (each with various special services)

A. DIALOG Information Services, Inc. Palo Alto, CA
- basic system of about 175 databases
- Knowledge Index
- DIALORDER

B. BRS (Bibliographic Retrieval Services, Inc.) Latham, NY
- basic system of about 80 databases
- BRS/After Dark
- Message service (MCI)

C. NLM (National Library of Medicine) Bethesda, MD
- MEDLINE and about 15 databases in related areas

D. Others
- "Search Helper" (Information Access); Sci-Mate (Institute for Scientific Information); other software
- H.W. Wilson indexes online in 1985
- Derwent (patents—also available through DIALOG)
- LEXIS, WESTLAW (Full text legal databases)
- SDC

III. Databases

A. Types
   1. Citation
   2. Full Text
   3. "Reference"
   4. Non-bibliographic
   5. Personal (creating own database)

B. Scope
   1. Standard daytime systems
   2. BRS/After Dark and Knowledge Index

IV. Concepts and Mechanics of Searching

A. Problem Statement
B. Choosing Databases
C. Query (subject) Terminology
D. Boolean Logic/Positional Operators
E. Search Strategy; plan formulated ahead of time
F. Search Execution
G. Summary:
   1. Quality searching is complex
   2. Regular activity level required
   3. Acquirable skill with individual expertise varying
   4. Requires background knowledge and judgment

V. Costs

A. Equipment
B. Communications
C. Direct costs
D. Training
E. Documentation

VI. Advantages vs. Limitations

A. Assets/Pluses
   1. tedium saving
   2. powerful
   3. thorough
   4. unique access
   5. timely

B. Liabilities/Minuses
   1. sources unavailable
   2. literal, dumb machine
   3. incomplete files
   4. no serendipity
   5. costs

C. Appropriate Searcher?
   1. End-user
   2. Intermediary

D. End-users: When? How? Who?

VII. Conclusions

A. Shop carefully for one best databank
B. Become knowledgeable about a few most important databases
C. Recognize the limits of your own search skills
D. Be generous in estimating total costs of searching online
E. Feel free to consult with PSU Libraries re: own in-house searching operations
F. Seek an intermediary searcher for complex, complete literature reviews

VIII. Demonstration/Practice on BRS/After Dark (example system)

IX. Discussion and Evaluation

APPENDIX B
REGISTRATION FORM FOR ONLINE DATABASE SESSION

To help us make the session as valuable for you as possible, please answer the following questions and return this form to Nancy Struble, E111 Pattee, before the session to confirm your registration.

* *

1. What is your main interest in this session? You may check all that apply but please put in priority order with #1 being most relevant:

___ To gain general knowledge of potentials/limitations of bibliographic databases
___ I plan to use the University Libraries' Search Service in the future and want to learn more about it
___ I plan to use (or already use) one of the systems such as DIALOG personally
___ Other—please specify: _____

2. Are you primarily interested in (check as many as apply):

___ Databases in general
___ Medicine/health
___ Biosciences
___ Engineering
___ Business
___ Earth sciences
___ Humanities
___ Education
___ Psychology
___ Journalism/news
___ Patents
___ Grants
___ Government reports/publications
___ Other—please specify: _____

3. Do you presently have an account with a databank (DIALOG, NLM, etc.)?

___ NO
___ YES
If yes, please specify system: _____

4. Circle your experience level:

NOVICE; MODERATELY EXPERIENCED; VERY EXPERIENCED

5. If you're not a present user, do you plan to get such an account in the next year or so?

___ NO
___ UNDECIDED
___ YES

If yes, which databanks are you planning to access (if known)?

___ DIALOG
___ DIALOG's Knowledge Index
___ BRS
___ BRS/After Dark
___ National Library of Medicine (e.g. MEDLINE)
___ SDC
___ ISI (Institute for Scientific Information)
___ Other—please specify: _____

6. Do you presently own or have easy access to a personal computer or terminal and modem?

___ YES, I own one Type: _____
___ I have access to one
___ NO

7. Comments, if any: _____

_____

_____

_____

* *

Your NAME: _____

ADDRESS (Campus, preferably): _____

_____

_____

PHONE #: _____

DEPARTMENT: _____

STATUS (faculty, staff, grad, etc.): _____

THANK YOU!!

APPENDIX C
"USING PERSONAL COMPUTERS FOR INFORMATION RETRIEVAL: A CONSUMER'S GUIDE"
POST-SESSION QUESTIONNAIRE

1. Did the session cover what you expected?

___ yes
___ no (If no, were there any areas you can identify for us to include in the future?)

2. Which parts of the session did you find particularly valuable?

___ Description of available databanks
___ Description of available databases
___ Outline of search techniques
___ Demonstration
___ Outline of costs
___ Outline of advantages/limitations

Comments? _____

_____

_____

_____

3. Which parts of the session were less valuable?

___ Descriptions of available databanks
___ Descriptions of available databases
___ Outline of search techniques
___ Demonstration
___ Outline of costs
___ Outline of advantages/limitations

Comments? _____

_____

_____

_____ ►

4. Was the session (2 hours):

___ too long?
___ too short?
___ about right?

5. Would you attend a more detailed seminar in your subject area if it were offered?

___ no
___ yes (please indicate area): _____
___ undecided

6. Do you think a "user group" should be formed on campus for people using any of these databanks?

___ no
___ yes
___ undecided

7. After today's session, are you planning to investigate further any of the databanks we discussed?

___ no
___ yes
___ undecided

If yes, which one(s)?

___ BRS
___ BRS/After Dark
___ DIALOG
___ DIALOG's Knowledge Index
___ SDC
___ Sci-Mate
___ ISI
___ PSU's Online Search Service
___ NLM
___ Other (specify): _____

8. Do you think the University Libraries should consider offering some type of formal/informal consulting service for people on campus who are personally using these systems?

___ no
___ yes
___ undecided

9. Should the University Libraries offer formal training in online bibliographic searching for people such as yourselves?

___ yes
___ no
___ undecided

Your name:

Address:

THE AUTHOR

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She is active in the American Library Association and Special Libraries Association.

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INFOTRAC IN ACADEMIC LIBRARIES: WHAT'S MISSING IN THE NEW TECHNOLOGY?

by Cynthia Hall and Harriet Talan
San Francisco State University
and
Barbara Pease
California State University, Chico

Students like InfoTrac; it offers a quick sense of mastery of library resources. Many students never discover that their mastery may be illusory. "InfoTrac has saved me a great deal of time that I would have spent searching through the *Biological Abstracts*,"[1] wrote one satisfied student. Of course, InfoTrac also saved the user the time it might have taken to read articles in biological journals, indexed thoroughly in *Biological Abstracts* and not at all in InfoTrac. Information Access Company (IAC), producer of InfoTrac, boasts that students can use InfoTrac without assistance. Indeed they can, but the quality of the result is in question.

Many articles about the InfoTrac system have appeared recently in the library and information science literature. Several describe the mechanics of InfoTrac: hardware, software, installation, and costs at particular academic library sites.[2] Several report user reactions to InfoTrac.[3] Almost all reach similar conclusions: the technology is a major breakthrough for libraries; college and university students like it and use it heavily; libraries that have it would have difficulty giving it up. One is more negative, explaining one library's decision to discontinue its subscription.[4] Our experience with InfoTrac for over a year at two California State University campuses confirms that laserdisk technology is a boon to information seekers, saving them time in locating references and freeing them from the tedium of hand-copying citations. It is convenient for libraries in that the cost, although substantial, is fixed, unlike the costs of other computerized literature search services.

However, although InfoTrac offers advantages for libraries and library users, many of these advantages bring with them problems which we believe should be addressed, and not obscured by the system's popularity or by IAC's claims for its product. In this article we would like to share our reservations about InfoTrac as a research tool in academic libraries and to comment on some educational issues related to IAC's claims that InfoTrac requires no assistance from librarians.

JOURNAL COVERAGE ON INFOTRAC

Promotional literature for InfoTrac stresses the comprehensive coverage it offers and its potential usefulness to research. "References to nearly one half million individual articles" drawn initially from "over 1000 business, legal, technical and general interest publications," selected to reflect the "periodical collections of major research libraries," says an early IAC flyer about InfoTrac.[5] IAC has since reduced the number of periodicals indexed in InfoTrac by removing the legal periodicals and marketing a separate LegalTrac database. A 1986 listing of "journals" indexed in InfoTrac contains 843 titles.[6] The initial bias toward business periodicals has not changed. Approximately 75% of the periodicals indexed by InfoTrac are business related, while 25% are general interest titles. Few, strictly speaking, are

scholarly or research journals, and most of these, as is to be expected, are in management, finance, or economics. Students and faculty at both our campuses have begun to notice InfoTrac's overall lack of scholarly research journals. "Doesn't list scientific periodicals," "Not enough information in science fields," and "Did not cover topic being searched (manufacturing engineering)" were comments on student evaluation forms. Recognized scholarly and research journals such as *American Political Science Review, American Sociological Review, Astrophysical Journal, Journal of Biological Chemistry, Journal of Personal and Social Psychology, New England Journal of Medicine,* and *Physical Review Letters* are absent.

A survey of California State University, Chico, periodical holdings that are indexed by *Social Sciences Index, Readers Guide,* and InfoTrac revealed that Chico owns 94% of the titles indexed in *Social Sciences Index,* 90% of the titles in *Readers Guide,* and 63% of the titles in InfoTrac. More significant, the overlap between InfoTrac and *Social Sciences Index,* for periodicals held at Chico, is only 16%. The overlap between InfoTrac and *Readers Guide* for periodicals held at Chico is 70%. These figures merely put into better perspective InfoTrac's claims to be a comprehensive research tool for academic libraries.

In addition to the bias of InfoTrac toward business-related titles, the selection of business titles includes many trade and industry publications. Approximately sixty titles are local business news publications from cities and regions across the U.S. and Canada (*Saskatchewan Business, Kansas City Business Journal, Business First—Columbus,* for example). Others, such as *Platt's Oilgram,* are highly industry-specific; Platt's, for example, is held by no academic library in the San Francisco Bay area. *American Banker,* published five times per week, costs $460.00 per year. The last two are now frequently requested periodicals at both our libraries, due to their inclusion in the InfoTrac database. As academic research journals, however, they do not qualify.

INDEXING ON INFOTRAC

The validity of a student's search on InfoTrac is further likely to be reduced by inconsistent, incomplete, or inaccurate indexing. "John Kenneth Galbraith, dead? I was assigned to hear his art and politics lecture next week," an economics major moaned. John Kenneth Galbraith had not passed on, the librarians had to assure her. With only a few days before the lecture and an assignment to locate a few relevant citations, the student had turned to InfoTrac. There she entered **Galbraith** and found only a handful of citations under J.K. Galbraith. She tried again under **Galbraith, John Kenneth,** and discovered under his full name the sub-heading **–Death of.** InfoTrac had confused the vibrant Galbraith with a John Galbraith who had died of lung cancer, and whose family was conducting litigation against tobacco companies, and had assigned the economist's middle name to the other Galbraith.

InfoTrac's database is embarrassingly filled with inaccuracies and inadequacies in its authority files, in spelling, in subject headings, and in citations. Of course, errors can be found in any index, whether print or ROM or laserdisk. We have no hard evidence, only our impressions, that InfoTrac's error rate is significantly higher than that of most print indexes. At San Francisco State University we began to collect errors printed out from InfoTrac. They involved subject headings, citation inaccuracies, spelling errors. As the pile of printouts grew, and as our attempts to share our findings with IAC showed no result, we came to think that we were wasting our time trying unsuccessfully to prompt IAC's interest in quality control. We believe, moreover, that errors and inaccuracies are aggravated when they are packaged and promoted as the newest and best of computer technology for libraries. Further, more students and more naive students are using InfoTrac without instruction or guidance; more are therefore likely to be misled by the errors and omissions.

IS INFOTRAC SIMPLE AND FAST TO USE: NO ASSISTANCE NEEDED?

One very significant feature of InfoTrac is that it attracts to the library many students who have not been frequent library users, and some who have not used the library before at all. Previously bibliophobic undergraduates flock to it. Heavy use occurs with almost no library-sponsored publicity and with little or no instruction by librarians. Students are excited by the convenience of the system. "Makes research actually fun!" wrote one undergraduate on an evaluation form. The attractiveness of the system to libraries is obvious: here is a highly popular device that needs no advertising other than word of mouth, and that increases library use without appearing to increase the demand for reference service or for instruction. Students learn to use it by watching others use it, by trial and error, or by asking the students next to them for help. In our libraries, InfoTrac users tend not to ask for help at the reference desk except for technical problems such as depleted ink cartridges or a system crash. Yet their evaluation forms (reporting finding little or nothing on computer science, for example) often show that help was needed. ►

The relative independence of InfoTrac users thus poses problems for reference librarians. Despite IAC's claims, InfoTrac has not made the educational task of reference librarians obsolete. From the responses on student evaluation forms and from direct observation, it is evident to us that many students use InfoTrac in place of more appropriate subject indexes or abstracts, that many students are unaware of—or ignore the subject limitations of—the database, and that students often use inappropriate or inadequate search strategies. Students at one or another of our campuses have used InfoTrac to attempt to gather information on the following topics, only minimally appropriate to InfoTrac's database: "nitrogen-fixing bacteria," "Watergate," "the oil embargo of 1970-1974," "adobe architecture," "Dashiel Hammet[sic]," "the diabetic athlete." Although in some cases they may have found one or two citations, InfoTrac is clearly not the best source of information on these topics. Did the students search further in other indexes or did they give up without finding anything, or stop with a few marginally relevant citations, thinking "This is all there is?"

With computers there is an illusion of completeness that does not exist with printed works. Who explains to students the limitations of the InfoTrac database and suggests other sources? Some students, who may have been quite successful searching their own topics on InfoTrac, may still lack the sophistication to know why they were successful, and to instruct their friends in search strategy. Reference librarians, of course, can explain to students how best to search InfoTrac and when, but only if the students approach the reference desk or are receptive to instruction. InfoTrac's technology, and IAC's insistence that searching requires no training, reinforce the naive library user's misapprehensions of the research process in general and of computerized searching in particular. The initial screen encourages users to begin immediately by typing in the subject or name they wish to search. An IAC flyer received early in 1986 states, "No special training is required," and "No knowledge of a controlled vocabulary or specialized search protocol is required."[7] Yet at least one student has admitted having to learn by trial and error to type last name first when searching on InfoTrac. Several other students have mentioned problems with "knowing exactly what search topic to use," "figuring out how to list topic for search," or "finding instructions for use," suggesting that at least some students are becoming aware that search strategy is more complex than they may at first have imagined. Others reported searching InfoTrac for subjects on which the database has a wealth of information and finding little or nothing. Examples of topics of these less successful searches are "computer science," "Pan American World Airways," and "hunger in America." Although we can't be sure what special aspects of these topics these students may have been looking for, several screens of citations appear for each of these topics.

We believe it is important for librarians and administrators to look critically at IAC's claims that InfoTrac is simple to use and requires no help by librarians. As academic librarians we have an educational obligation to the students who are brought into the library by the attractiveness of a new technology. Although InfoTrac *can* be searched by a novice with no training; as with most new technologies, learning to search effectively on InfoTrac requires some effort on the part of the searcher to understand and to master the system. Some improvement can be gained by careful reading of the help messages incorporated into the system, but you must be patient enough to read them. Although the most curious and able students will do this on their own, the majority of students have been attracted to InfoTrac because it promises to make research easy and to require little or no work on their parts, and this majority is likely to define careful reading as "work."

In an academic environment, librarian and staff time will inevitably be spent instructing users of InfoTrac, whether instruction occurs in a one-to-one exchange at the reference or periodicals desk, in instructional handouts and signs, or in library instruction programs. It is unfortunate that, because of the illusion of completeness and infallibility that accompanies computer technology, only after repeated use of InfoTrac, if at all, do students begin to suspect that there is more to information retrieval than pushing buttons.

DOES THE COMPUTER DO THE RESEARCH?

InfoTrac's most attractive feature, the immediate availability of a printout, can save good students much time and free them from inadvertent errors in copying. It also appeals to students who are tired of taking notes, and perhaps tired of the entire research process. An earlier IAC product, Search Helper, was marketed with the slogan, "Use a computer to do your research," and InfoTrac too feeds the sense that the computer will do it all for you. People often seem willing to endow computers with the human intelligence necessary to bring meaning to the alphanumeric strings they type at the keyboard. No computer yet, however, can substitute for the human thought neces-

The process of identifying and procuring relevant information, the research process, has two components. One is mechanical and can be greatly enhanced by computers, with printers and other peripherals. The other is critical and evaluative.

sary to conduct research. The process of identifying and procuring relevant information, the research process, has two components. One is mechanical and can be greatly enhanced by computers, with printers and other peripherals. The other is critical and evaluative. Improvement here comes from determined work and practice in planning search strategy, in analyzing and evaluating sources, and in defining areas for further study. As academic librarians we want to foster these intellectual processes and not to mislead students into thinking that research is merely mechanical.

The dilemma with InfoTrac is that discrimination and evaluation can too easily be dispensed with. The user merely prints all citations under a particular subject. Although the user has the option of selecting individual citations, retrieving an entire page is easier and relieves the student of the decision-making which accompanies the use of printed or ROM indexes where citations must be handwritten. The user of InfoTrac is also spared the awkwardness of not knowing what or how much from each citation to record. This may be a major reason for InfoTrac's attractiveness to unsophisticated users. One of the drawbacks we see in the InfoTrac version of the new technology is that it offers no incentive to learn from it. It has sacrificed its educational potential for speed and convenience. Wilson Company indexes, also designed for naive users, are not on the surface so immediately easy to use as InfoTrac, nor so immediately seductive to users. Yet the construction of Wilson subject headings and cross references implicitly teaches something about search strategy. The headings and subheadings, with their *see* and *see also* references, directly show the fundamentals of information structure. InfoTrac, with its emphasis on speed and convenience, only hints at the need for a search strategy. Although there are *see* and *see also* references in InfoTrac, typing a phrase such as **hunger in America** is likely to result in a match with the title of a book being reviewed, and no cross reference to *Hunger—United States*, the Library of Congress term under which many more citations might be found.

Because of the narrow focus of a computer screen displaying eleven citations at a time, as opposed to a double-page spread of a print index or even to a ROM index screen, the pattern of data entry is not immediately apparent to the user. Students are apt to be the losers in this game of hide and seek because they do not understand the nature of the game.

Also, paradoxically, we find that students chose InfoTrac for its speed and convenience, and then spend many minutes scrolling through page after page of data rather than structuring a more efficient search by first using the subject guide to locate the most precise heading. Might we not ask what, if anything, these students are learning from their reliance on InfoTrac?

USERS LIKE INFOTRAC, BUT IS IT JUNK FOOD?

The near unanimous user acceptance of InfoTrac raises for us the question, "Is the customer always right?" Do we evaluate an index or a database primarily by immediate user satisfaction, especially when the users appear to be somewhat naive about libraries and information retrieval? Might there not be an analogy to junk food, which also seems to satisfy, but which nutritionally cheats the consumer without the consumer being aware of being cheated?

We may appear to be opposing what many students believe to be the library's most important and best offering to them so far. We suspect that if the InfoTrac database were reduced to print form and stacked up next to other prominent indexes, such as those of the Wilson Company, and offered at prices comparable to those of the Wilson indexes, it is likely that many librarians would reject IAC's version. Yet we do not advocate removing the printers from InfoTrac, as some libraries are reported to have done to reduce maintenance and, incidentally, to put InfoTrac more on a par with other indexes. Nor do we advocate a wholesale return to the tedium of old-fashioned methods of information-gathering using print indexes, although several hand-copied citations from *Psychological Abstracts* may be worth more than a printout of citations to articles in *Psychology Today*. The technology on which InfoTrac is based is obviously the way of the future. Students need to be comfortable with this technology and to learn what it can teach them. We only want to put InfoTrac, the first of the commercially available laserdisk in- ►

dexes, into perspective. Following the junk food analogy, our answer would not be summarily to remove the candy machine, but to inform the student consumers so that they themselves can choose which index to use when, and can use effectively whichever they choose. This brings us back to providing instruction for use of an index which its producers insist needs no instruction.

Our hope is that InfoTrac, by attracting new students to the library, will allow these students to get some idea of the wealth and variety of resources available. Some students who begin with InfoTrac may be led to other useful library sources as well. The independence InfoTrac promotes may motivate students to develop similar independence with other methods of library research. Or, reliance on InfoTrac may promote dependence on a database inadequate for many academic subjects: It could develop trust in a hit-or-miss, hazily understood method of information retrieval. The independence that students and librarians prize may prevent students from being guided to better information sources and from developing useful research strategies of their own.

FOOTNOTES

[1]This and subsequently quoted student comments are taken from librarians' direct observations or from evaluation surveys (unpublished) at California State University, Chico (April 1986) and at San Francisco State University (April 1985).

[2]Carney, Richard, "InfoTrac: An Inhouse Computer Access System," *Library Hi Tech* 3 (1985): 91-94; Herschman, Judith, and Maultsby, Kristen, "Sidebar 1: InfoTrac: Impressions from a Beta Site," *Library Hi Tech* 3 (1985):93-94; Pease, Barbara, and Post, William, "InfoTrac: A Review of an Optical Disk Based Public Index," *Serials Review* 11 (Winter 1985).

[3]Beltran, Ann Bristow, "Use of InfoTrac in a University Library," *DATABASE* 9 (June 1986): 63-66; Ernest, Douglas J., and Monath, Jennifer, "User Reaction to a Computerized Periodical Index," *College and Research Libraries News* 47 (May 1986):315-318; Stephens, Kent, "Laserdisc Technology Enters Mainstream: Easy to Use Periodical Index Gets Heavy Use at California University," *American Libraries* 17 (April 1986):252; Tenopir, Carol, "InfoTrac: a Laser Disc System," *Library Journal* 111 (1 September 1986): 168-169; Walker, Mary Ann, and Westneat, Helen, "Using InfoTrac in an Academic Library," *Reference Services Review* (Winter 1985): 17-22.

[4]Van Arsdale, William, and Ostrye, Anne T., "InfoTrac: A Second Opinion," *American Libraries* 17 (July/August 1986):514-515.

[5]"InfoTrac: InfoTrac Searches Millions of Articles in 10 Seconds: It's Simply Amazing," Belmont, CA: Information Access Company, [n.d.].

[6]"Journals Indexed in the InfoTrac Database," Belmont, CA: Information Access Company, 1986.

[7]"How to Search with InfoTrac," Belmont, CA: Information Access Company,[n.d.].

THE AUTHORS

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ERIC ON CDROM: A COMPARISON OF DIALOG ONDISC, OCLC'S SEARCH CD450 AND SILVERPLATTER

by Jean Reese
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INTRODUCTION

In the past months, the library scene has been bombarded with literature concerning CDROM, a technology that has been touted as "the new papyrus," an information storage medium as revolutionary as papyrus was in its day. Though the new industry has not boomed as originally predicted, [1] it is witnessing the debut of many products of interest to libraries, from a variety of sources. For example, publishers such as R. R. Bowker, H. W. Wilson, and McGraw-Hill are exploring this new technology as an alternative medium to complement their print and online products. Noted software publisher, Microsoft, recently introduced a reference product and has been instrumental in promoting the growth and standardization of the industry. There are companies like SilverPlatter Information, Inc. whose sole function is developing these products from machine-readable data, purchased from the original producers. The giant of online database services, DIALOG, also entered the market with their OnDisc product line, the first of which is **ERIC**. In April, OCLC released a version of ERIC and announced plans for other CDROM products. Initial fears of lack of standardization and compatibility have been somewhat allayed as almost all of the available products have similar hardware requirements and to some degree are interchangeable. The decision facing many libraries now, is not whether or not to buy CDROM products, but which product or products to buy.

The focus of this article is not to discuss the pros and cons of CDROM in general, although our experience with this technology has been very favorable. For a more thorough review of the costs and benefits of CDROM, we recommend Ralph Alberico's "Justifying CD-ROM." [2] Nancy Herther's "A Planning Model for Optical Product Evaluation" offers excellent advice to anyone considering this technology and stresses careful review of available products. [3] Her article and Bonnie Snow's [4] contain checklists for evaluating CDROM products. To aid the selection process, we will compare the three versions of the ERIC database currently available: those of SilverPlatter, OCLC, and DIALOG.

BACKGROUND

The Jean and Alexander Heard Library of Vanderbilt University is involved in a two year Enhanced Information Access Project, partially funded by a grant of $750,000 from the Pew Memorial Trust, to provide access to bibliographic and full-text files in electronic format, to the academic community. Optical disk technology is one of the modes of access being researched as a part of this project, and several different CDROM products are being used throughout the library system. The Education Library at Vanderbilt served as a test site during OCLC's product development, and had the opportunity to use several versions of their **CIJE** portion of ERIC, since August 1986. SilverPlatter and DIALOG both consented to lend us copies of their product for evaluation and the writing of this article.

USERS OF THE SYSTEMS

The three products are set up on separate workstations and are available for all users of the Education Library. Most of the patrons using the systems are graduate students and faculty members in the fields of education, psychology, human development, and library and information science. Uses of the systems range from short class papers to dissertation research. The reference staff makes frequent use of the CDROMs for ready reference and to prepare, supplement, and even substitute for online searches.

There is heavy traffic at the stations, especially during late morning and afternoons. We placed log books next to each workstation to monitor how often and for how long the computers were being used. Patrons were requested to sign their names, starting time, and ending time. As often as possible, we tried to remind patrons to sign in, but it is impossible to say everyone did so. Nevertheless, the results are impressive. The number of searches performed on the three systems was 482, with the individual statistics fairly evenly divided. SilverPlatter was searched most frequently (177), while OCLC (155) and DIALOG (150) were close behind. Amounts of time spent at an individual station varied from about two minutes to over three hours. It was not uncommon for a person to stay more than an hour at one

time. On many days, the stations were busy from opening time at 8:00 am until at least 9:00 pm, with very few idle gaps.

HARDWARE REQUIREMENTS

As the chart demonstrates, the hardware requirements for these products are similar. An IBM or compatible microcomputer (OCLC requires XT or AT) is the basic requirement. DIALOG requires only 384K, but recommends 640K. SilverPlatter has released a list of compatibles which have been tested, [5] and lists of others may be available by contacting the suppliers. We have had no problems using the Z-248 (AT-compatible, 512K) from Zenith Data Systems with any of the products. Only SilverPlatter does not require storage space on a hard disk. Each one can be configured for either Hitachi or Philips CDROM drives, but OCLC and SilverPlatter will also operate with Sony drives. (The DEC drive is actually manufactured by Philips and can also be used with all three.) The controller card and cable for the CDROM drive is usually included with the purchase or lease. (We did experience some problem of compatibility with an older model of controller card, CD-IFI2, with SilverPlatter's latest release and with DIALOG OnDisc, but the new card, CD-IFI3, works with all three.) Monochrome monitors will work with all, but DIALOG's product was designed to make use of color. We are using an amber monochrome monitor with the DIALOG disk, and have only noticed one screen where the command prompt is not clear. If we decide to purchase this system, we may decide to upgrade to a color monitor. A DIALOG representative states that about half of their OnDisc users are using color monitors. DIALOG's product also offers the capability of online access, which requires a Hayes-compatible modem and telephone line for connection. As outlined on the chart, each of the companies offers lease or purchase options for hardware.

INSTALLATION PROCEDURES

DIALOG OnDisc works with DIALOGLINK, their telecommunications software. With our demonstration CDROM, we received two components: the Communications Manager and the OnDisc Manager. The disks are not copy protected, and you (the installer) are advised to make backup copies of the disks and to use the backups during installation. To install the system onto the fixed disk, you are instructed to create a subdirectory for the DIALOGLINK files. Using the backup copy of the Communications Manager disk, you run the "configure" program and answer a series of questions about the type of equipment you have, and enter telephone numbers and passwords for your DIALOG account(s). (If the Communications Manager has already been installed, you will need to run "configure" again to add the OnDisc Manager.) If the station is going to be in a public area and the online capability causes you some concern, you do have the options of "locking" the system into the CDROM modes or not entering your passwords into the communications manager. If the passwords are not installed and a user chooses the **Online Search** option, he will be prompted to enter his password before he can continue. The OnDisc Manager prompts you to enter which type of CDROM drive you are using (Hitachi or Philips) and adds the appropriate information to a CONFIG.SYS file in your root directory. If you purchase DIALOGLINK's Account Manager, it will also be installed at this time with the same type of menu approach. The documentation for the entire installation procedure is clear and the menus are straightforward. You always have the opportunity to return to previous questions and previous screens by pressing the appropriate keys.

SilverPlatter's installation procedure is also well documented and easy to follow. You will receive two floppy disks (a Setup Diskette and a Database Diskette) and a manual which includes step-by-step instructions for installing the system on computers with either two floppy disk drives, one floppy disk drive, or hard disk. The documentation encourages you to create a "system diskette" and run SilverPlatter from a floppy even if you have a hard disk. We found that to be good advice. (The CONFIG.SYS file required by SilverPlatter is different from the ones required by DIALOG or OCLC, so it is helpful to have SilverPlatter's system diskette from which to boot the computer if you only have one machine to run different systems.) You will begin by formatting a new diskette, which will become your system diskette. When you run the setup program, you will specify which type of printer you have (if any), which type of CDROM drive you have, the default number of citations which will be printed when the print command is issued, whether or not you want users to be able to exchange CDROM disks themselves, which SilverPlatter databases will be used at the station, and whether or not the station is to be "dedicated." Each time you answer a question, the program repeats your response so you can make sure you answered correctly before continuing. The entire process took us only 15 minutes and the system diskette was ready.

OCLC's installation was the simplest and fastest of all. Three diskettes are supplied, which you first copy to create working disks. With the first of the three disks in the a: drive,

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you type **a:install** and the installation procedure begins. You only have to answer one question regarding which type of CDROM reader you have and the rest of the work is done for you. A directory for the Search CD450 system is created and files from each of the three disks (you are prompted when to change disks) are copied to your hard disk. A CONFIG.SYS file and an AUTOEXEC.BAT file are created and added to your root directory. If you have existing files with these names, you will have to rename them. The instructions for doing this are included. We started with a brand new computer for this installation and did not have to follow this procedure, so the entire installation took approximately ten minutes.

SCOPE/COST/TERMS

Each company covers the full range of ERIC with the exception of OCLC, whose **RIE** begins with 1967 rather than 1966. SilverPlatter and DIALOG have managed to get the full set on three disks, while OCLC's product will consist of four. For OCLC's field test, we used a single disk containing only CIJE records. The latest OCLC disk contains the full file of CIJE, 1969-1986, but also offers the choice of searching a "current" file, 1982-1986. Each producer offers quarterly updated subscriptions. Since we have not been full-fledged subscribers, we will not be able to evaluate their promptness with updates.

Readers following the ERIC CDROM trail may have witnessed the price war which has developed. SilverPlatter was the first to release ERIC with the initial price of $1750 for the current subscription. After OCLC's announcement of their cost structure, SilverPlatter reduced its price. DIALOG's initial price was announced as $1950 for the current disk, but was also soon reduced. The price for DIALOG's current subscription is still slightly higher than the others, but the biggest difference lies in their practice regarding the archival set. OCLC and SilverPlatter both offer a one time purchase arrangement for the archives, but DIALOG's package consists of a licensing fee which is paid each year. OCLC members are eligible for discounts on their product. Full pricing information is included on the accompanying chart.

SEARCHING THE SYSTEMS

Each of the systems provides sophisticated searching capabilities including free-text searching, field qualifications, Boolean logic, expansion of search terms, truncation, nesting, and proximity searching. SilverPlatter's and OCLC's are both command driven, while DIALOG offers two levels of searching: **Easy Menu Search** for the novice and **DIALOG Command Search** for the experienced DIALOG searcher. The chart summarizes the search capabilities of the three systems, but a closer look at how they handle free-text searching, indexing, and Boolean logic is necessary for an adequate comparison.

DIALOG ONDISC

The initial menu of the OnDisc system offers the options of **DIALOG Command Search**, **Easy Menu Search**, **Online Search**, or **Return to DOS**. The first choice allows you to search using the DIALOG commands and is a useful feature for those already familiar with DIALOG. Our librarians have found it a quick and convenient way of using the system. New online searchers can refine their skills without the cost of actual online searching. Since most of the commands such as select, expand, limit, type, and save are executed the same as in searching DIALOG online, we will not elaborate on them.

Most end-users use the **Easy Menu Search** mode (Figure 1).

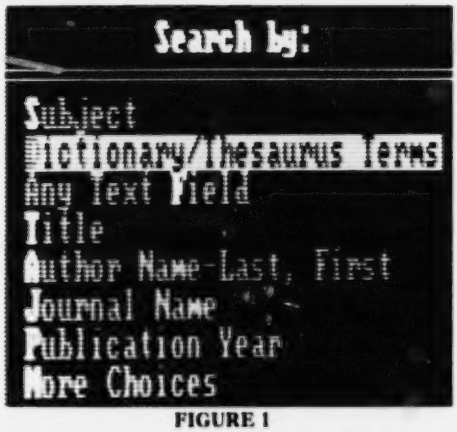

FIGURE 1

For the DIALOG OnDisc system, most end-users use the EASY MENU SEARCH mode, which begins with this screen display.

The selection of **More Choices** brings up a similar screen which includes the **Advanced Search Options** of **Major (*) Descriptor/Identifier**, **Identifier**, **Abstract**, **Corporate Source**, **Language**, **Document Type**, and **Clearinghouse Code**. Your choice from these screens will determine whether or not your search terms will be selected from an index display or entered directly as free text.

Free-text Searching

If you choose to search using **Any Text Field**, **Title**, **Major (*) Descriptor/Identifier**, **Identifier**, **Abstract**, or **Corporate Source**, you will be prompted to type in your terms. Words typed with spaces between them are searched as adjacent terms. You may also specify that two terms have one or two words separating them, which is particularly useful for omitting stop words, by inserting one or two periods between them. If you wish to

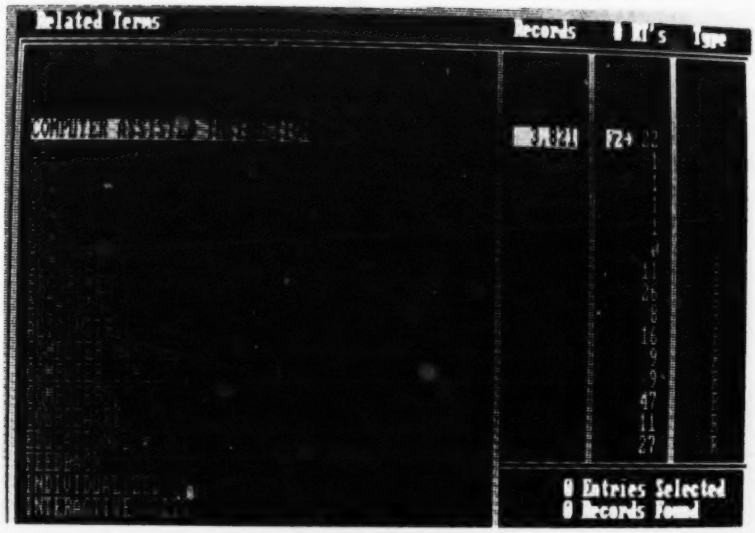

FIGURE 2

A very attractive feature of DIALOG OnDisc is the thesaurus option which offers lists of related terms. Similar to the online EXPAND, this index displays the number of related terms in a column next to the number of records.

search for words in the same sentence or same field, you may separate them with an "_" or an "," respectively. Alternate terms ("or" combinations) are separated by commas.

The truncation symbol is the question mark in both the menu and command search modes. The screen displays each word being searched as a result of your truncation and the total number of hits for each term is displayed.

One field which is not searchable with DIALOG OnDisc is the accession or report number. Limiting to **EJ** or **ED** is possible in the **Command Mode**, but direct record access is not available in either mode of searching.

Selecting Terms from an Index Display

The selection of **Subject, Dictionary/Thesaurus Terms, Author Name-Last, First, Journal Name, Publication Year, Language, Document Type,** or **Clearinghouse Code,** results in an index display. When you begin typing a search term, the index opens to display an alphabetical list of words based on your query. You use the up and down arrow keys and press return to select the desired terms, then press **F10** to enter them. If several terms are selected, they will be combined with "or."

A very attractive feature of DIALOG OnDisc is the thesaurus option which offers lists of related terms. Similar to the online expand, this index displays the number of related terms in a column next to the number of records. The expanded terms may be displayed by hitting the **F2** function key and may be selected using the same technique described in the preceding paragraph (Figure 2).

Boolean Logic

DIALOG's **Easy Menu Search** allows for the combination of search statements using Boolean operations, but the menu approach handles the process in a very unique manner. After an initial set has been created, using the technique described earlier, the result is displayed and a menu appears (Figure 3).

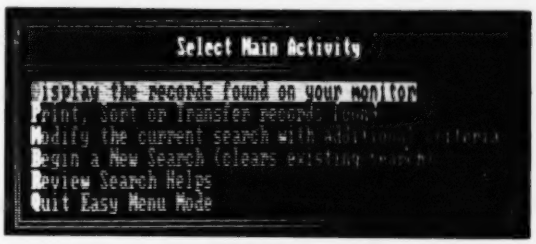
Select Main Activity
Print, Sort or Transfer records
Begin a New Search (clears existing
Review Search Helps
Quit Easy Menu Mode

FIGURE 3

DIALOG OnDisc's EASY MENU SEARCH allows for the combination of search statements using Boolean operations, but the menu approach handles the process in a very unique manner.

If you choose to **Modify the current search with additional criteria,** a menu of options for further modifying your search appears. The choice of **Limit with additional concepts or terms** results in the **"AND"** operation, while **Include alternate terms** results in **"OR."** To execute a **"NOT"** operation, you would choose **Exclude unwanted terms.** Either of these choices results in the display of the previous menu (Figure 1) and the

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repetition of the same technique. There is no limit to the number of times you may modify your search. It is important to remember that the modification works only on the results of your last set. You may also undo an operation, for example when the result is too narrow, by selecting **Delete search steps**.

SILVERPLATTER

The SilverPlatter system is controlled by 14 commands. Ten of these (**Help, Find, Guide, Show, Index, Print, Restart, Exchange, Previous,** and **Next**) are activated by pressing one of the function keys, **F1-F10**. Four other commands (**Options, Clear, Transfer,** and **Quit**) are available only from the Command Menu, which is displayed when you press the **ESC** key. The system uses the **Find** mode to search the database and is automatically in that mode when booted up. If you get out of **Find** to use the index or to print or show records, you can return by pressing **F2 (Find)** or **F7 (Restart)**. The **Exchange** key is used when you wish to search a different compact disk of the SilverPlatter set.

Free-text Searching vs. Field Qualification

SilverPlatter automatically searches for words (free text) unless they are qualified with field tags. For example, you type **library in ti** to find records with **library** in the title. A complete list of the field abbreviations is available on the help screens and in the documentation. Words typed with a space between are searched as adjacent terms. You may also use the proximity operators **with** or **near** to locate words in the same field or same sentence. A number can be added to **near**, e.g. **near3**, to specify that words must appear within so many words of each other (in any order) in the same sentence.

The truncation symbol used on SilverPlatter is the asterisk (*). We have found that truncation should be done very carefully to avoid lengthy searches. For example, the search for librar* took about five minutes to execute.

The truncation symbol used on SilverPlatter is the asterisk (*). We have found that truncation should be done very carefully to avoid lengthy searches. For example, the search for **librar*** took about five minutes to execute. (DIALOG's skill in indexing pays off here. It took less than one minute to search **librar?** in **Any Text Field.**)

Selecting Terms from an Index Display

When you press **F5**, the **Index** function key, you may search for terms, to get an idea of the number of records containing them. Unlike DIALOG's separate indexes for specific fields, SilverPlatter's system has one index which contains single words, phrases, controlled terms, author names, and journal titles. It is particularly useful for authors because they are indexed and searchable only as bound phrases. Journal names and descriptors can be searched quickly as bound phrases, but are also double posted for free-text searching. One frustrating feature about SilverPlatter's index is the inability to page up. Another disadvantage is that terms cannot be selected directly for searching. You must return to the **Find** mode and retype the word or phrase you wish to search. Since the index screen disappears upon entering the **Find** mode, you must remember the exact form of the phrase when you retype.

Boolean Logic

The logical operators, "And," "Or," and "Not," are used to combine terms or sets. The user types in the search statements and includes the operator of choice. Nesting terms, for example, **television and (commercials or advertising)** or **television not (commercials or advertising)** is permitted.

The design of SilverPlatter's **Find** screen allows previous sets and their results to be displayed while entering a new search. You may use previous search steps to create new sets by specifying the set number; for example, **#1** refers to set 1. The last search set may be modified by simply beginning the next **Find** statement with one of the Boolean operators.

OCLC

The screen for OCLC's Search CD450 is divided into three rectangles: the query window, results window, and record window. Occasionally, additional windows (for example, help information, index display, and menu for selecting formats) are superimposed on the normal display. At the bottom of each window is a line of prompts referring to the specific function keys (Figure 4).

Free-text Searching vs. Field Qualification

Search statements are typed into OCLC's query window in much the same way as on SilverPlatter. Like SilverPlatter, terms are searched free text unless qualified with field tags. For example, to find records on Search CD450 with **library** in the title, you type **library:ti**. A list of the fields to be used is readily available by pressing the **F3** function key. Author names

are not bound phrases as they are on SilverPlatter and DIALOG. The tags **au**, **la**, and **fi** may be used to qualify author names; **la** refers to the last name and **fi** the first.

Words typed with a space between them are assumed to be adjacent, although you may type **adj** if you wish. The order of the words is unimportant. For example, **adult illiteracy** will also retrieve **illiteracy adult**. One word of caution about free-text searching on OCLC: descriptor and identifier phrases are not double posted, but are only searchable as bound phrases. This practice can dramatically affect your search results as we will discuss more fully later.

OCLC's truncation symbol is also the asterisk, but as with SilverPlatter, we recommend caution in using it. Because of the large number of bound phrases in OCLC's index, searches using truncation can be very lengthy. The search for **librar*** took five minutes in the current file (1981-86) but took 25 minutes in the full CIJE file! As the search progresses and is tracked on the screen, you can see that it searches each phrase, combines it with the previous set, then searches the next phrase and combines it.

Selecting Terms from an Index Display

OCLC's index display, which you get by pressing **F2**, is like that of SilverPlatter, in that single words, phrases, descriptors, author last names (remember, they are not bound), and journal names are all combined. You may use the up and down arrows to select terms and press **Tab** to copy them into your query window. This practice is much easier than SilverPlatter's requirement of retyping. Many journal names appear as bound phrases in the index, but this is very misleading because they must be searched as free text and qualified using the **so** (source) field tag. For example, the search **journal-of-learning-disabilities** retrieves only one record, while **learning:so disabilities:so** retrieves 478. Another "fault" we have found with the index is the alphabetization of plural forms and bound phrases. As seen in Figure 5, bound terms like **day-care** come after words like **days** and **daytime**.

Descriptor terms are bound phrases and may be selected from the index or entered directly with the hyphen connecting multiple words. As we mentioned earlier, OCLC has decided not to double post these terms (despite our suggestion that it is highly desired). Therefore, you must take special care to use the system efficiently. The following searches (in the Current file) demonstrate how significant the difference in results can be. The search **mental retardation** (unbound) retrieved 253 records. The same words, bound as **mental-retardation**, re-

Display of Search Results and First Record Retrieved

Database: CIJE 82

Retrieved: 38
Record: 1
Score: 10

7>5! or 6!
8>

F2 = Index F3 = Fields F4 = History ↵ Enter Query

CIJE Accession Number EJ327180

AUTHOR: Stewart, Ida Santos

TITLE: Kindergarten Reading Curriculum: Reading Abilities, Not Reading Readiness

SOURCE: Childhood Education (v61 n5 p356-60 May-Jun 1985)
YEAR: 85

ABSTRACT
Addresses attitudes toward reading resulting in beginning reading instruction in the kindergarten and preschool curriculum. Argues that previously accepted notions of the necessity of reading readiness are no longer viable and encourages home and classroom support for the acquisition of reading abilities through written and oral language. (DST)

F5 = Previous F6 = Next F7 = Print F8 = Graph F9 = Format

Search CD450 F1 = Help F10 = Quit

FIGURE 4

The screen for OCLC's Search CD450 is divided into three rectangles: the query window, results window, and record window. Occasionally additional windows are superimposed on the normal display. At the bottom of each window is a line of prompts referring to the specific function keys. ►

INDEX window

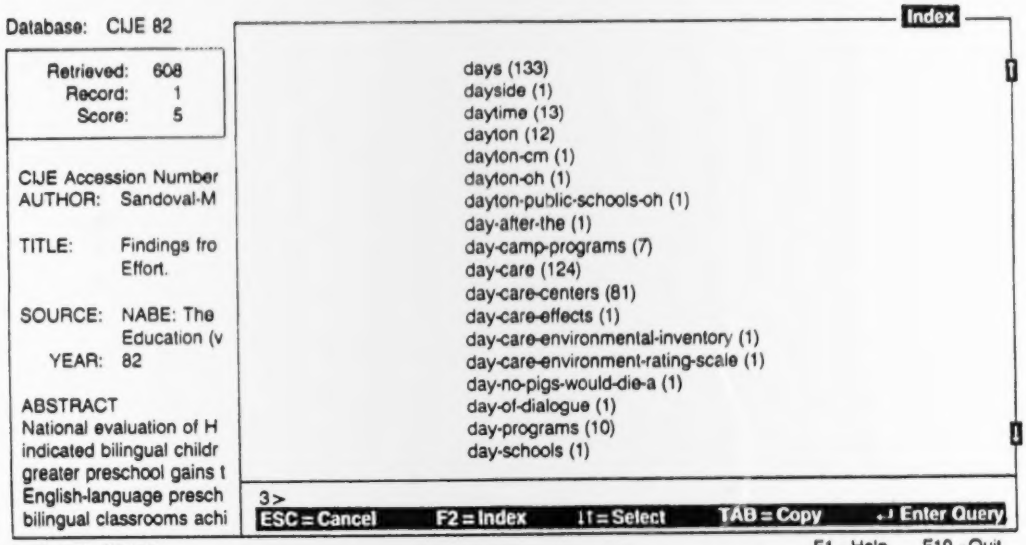

FIGURE 5

Another "fault" we have found with the index (OCLC) is the alphabetization of plural forms and bound phrases. Bound terms like "day-care" come after words like "days" and "daytime."

HISTORY Window Showing Past Searches and Their Results

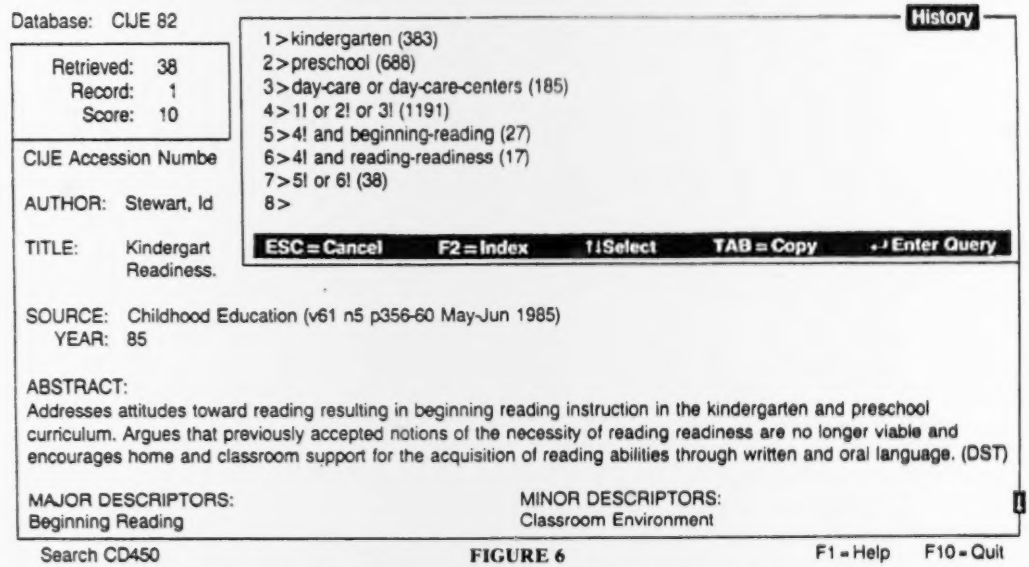
Database: CIJE 82
Retrieved: 38
Record: 1
Score: 10
CIJE Accession Numbe
AUTHOR: Stewart, Id
TITLE: Kindergart
Readiness.
History
1>kindergarten (383)
2>preschool (688)
3>day-care or day-care-centers (185)
4>1! or 2! or 3! (1191)
5>4! and beginning-reading (27)
6>4! and reading-readiness (17)
7>5! or 6! (38)
8>
ESC = Cancel
F2 = Index
↕ Select
TAB = Copy
↵ Enter Query
SOURCE: Childhood Education (v61 n5 p356-60 May-Jun 1985)
YEAR: 85
ABSTRACT:
Addresses attitudes toward reading resulting in beginning reading instruction in the kindergarten and preschool curriculum. Argues that previously accepted notions of the necessity of reading readiness are no longer viable and encourages home and classroom support for the acquisition of reading abilities through written and oral language. (DST)
MAJOR DESCRIPTORS:
Beginning Reading
MINOR DESCRIPTORS:
Classroom Environment
Search CD450
F1 = Help
F10 = Quit

FIGURE 6

OCLC's HISTORY WINDOW displays past searches and their results. Terms or phrases from the HISTORY WINDOW can be transferred to the new search by pressing the TAB key.

trieved 519. The combined set, **mental retardation or mental-retardation**, retrieved 625 records. Experienced online searchers expect to find fewer numbers when limiting searches to descriptors rather than searching free text. As a matter-of-fact, the same words when searched on SilverPlatter resulted in 1409 records free text, as opposed to 733 records when bound. When combining the sets (**mental retardation or mental-retardation**), the final results on SilverPlatter were the same as for the unbound phrase set. As you might expect, the search for **retardation:su** on OCLC retrieved zero hits because the word **retardation** was not found in the bound subject phrase **mental-retardation**.

We feel OCLC's practice in indexing these phrases severely affects the product's value as an end-user system. It might be acceptable for trained searchers who could construct strategies to overcome this obstacle, but most of the patrons using the system are untrained and are likely to walk away with misleading results. We learned to keep a watchful eye on the searcher and put a sheet with examples and explanations of the best way to search next to the computer. A brightly colored sign alerts them to the helpful hints available. However, sometimes books or papers cover the table. And besides, people do not always read everything they should.

Boolean Logic

OCLC's use of "And," "Or," and "Not" and parentheses to nest terms is similar to that of SilverPlatter. Previous sets can be re-searched and combined with other sets or terms by typing the set number and an exclamation point. For example, **1!** refers to set 1. However, the query window only displays the current search statement. Previous sets can be viewed by using the **History** function key. Terms or phrases from the history window can be transferred to the new search by pressing the **Tab** key (Figure 6).

DISPLAYING AND PRINTING SEARCH RESULTS

On OCLC, the first record appears in the record window as soon as a search is completed. On the other two systems, the user must issue a command to display a record. The **F4, Show**, key is pressed on SilverPlatter to display records, while **F8** is pressed to print. The options of **Display the records found on your monitor** or **Print, Sort, or Transfer records found** appear on the DIALOG activity menu.

Formats

OCLC and DIALOG each have predefined formats for displaying and printing records. The user selects from a menu of the available formats (Figures 7 and 8).

FIGURE 7
DIALOG predefined format

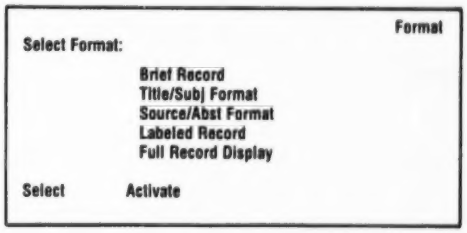

FIGURE 8
OCLC predefined format

Patrons often scan brief displays to select titles before displaying or printing fuller records.

SilverPlatter does not have a menu of set formats, but allows you to customize by selecting fields you wish to display or print. In the **Show** mode, there is a default of **All**, or full record, which results if no specific fields are chosen. The default format for printing is the citation, **Citn**. We have found that most patrons do not care to display or print the complete records, which contain some unnecessary fields. We often recommend using the citation plus an abstract, which is choosen by typing **citn,ab**.

Selecting a format is probably the one feature that novice users have the most trouble with on SilverPlatter. The choices and combinations sometimes seem troublesome to the first-time user, but offer a great deal of flexibility after you get accustomed to the system. Another problem that experienced as well as novices encounter is the necessity to tab over to select the number of records to be shown or printed. It is so easy to forget and mistakenly accept the default of **All**. For that reason, we set the default very low (ten records) when we were installing the SilverPlatter system. The default can be overridden by specifying the exact number of citations you want, e.g. 1-25.

Sorting

DIALOG and SilverPlatter sort the records according to type (journal articles or ERIC reports) then subsort the two sets so that the most recent ones of each type are displayed first. DIALOG displays **EJ** numbers first, and

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offers the user the option of additional sorting by author, title, journal name, or publication year. SilverPlatter displays **ED** numbers first and offers no sort capability. OCLC has a unique feature of sorting records based on their "score" which is derived by counting the number of times the search terms appear in the record. Items with the highest scores are displayed first. Also available on the OCLC system is a "graph" which shows how each record's score compares to others in the set. We have not found this "unique" feature to be very useful and prefer the chronological arrangement used by the other two companies. When searches are done using descriptors only, all of the records have identical scores and are displayed in chronological order similar to the other systems, except that the newer records are last rather than first!!!

We have also noticed that OCLC's product sometimes displays duplicate records. With descriptor searches resulting in over 100 hits, we often found records #100 and #101 to be duplicates.

Printing

Selections of records to print or printing all records is available with all three systems. The print option is selected from the DIALOG activity menu, and activated by **Print** function keys on OCLC and SilverPlatter. When you hit the print function key on OCLC, a window opens to ask you which records you wish to print. Because of this feature, you may print records as you see them on the screen and not lose your current search. In DIALOG and SilverPlatter, it is not practical to print one record at a time because the functions of searching, displaying, and printing are more isolated. You do not lose your search strategy when you display or print records with any of the three systems.

Downloading to a floppy disk or to the hard disk is available on all three systems. . .most of the users who want to download, have asked the reference staff for help, no matter which system they were using.

DOWNLOADING

Downloading to a floppy disk or to the hard disk is available on all three systems. DIALOG and SilverPlatter allow the searcher to name his file. OCLC assigns the name **SAVEFILE.n**, where "n" is a number assigned by the computer. DIALOG has the "transfer" option clearly displayed in the menu concerning displaying, printing, or modifying search results, making it easy for a user to make the choice to save to disk. OCLC has a help sceen menu which includes **Saving to disk** as one of the choices. SilverPlatter also has information available in the documentation and on help screens about how to save to disk, but requires a little more digging by the searcher to get it. Most of the users who want to download, have asked the reference staff for help, no matter which system they were using.

DOCUMENTATION AND USER SUPPORT

Success in getting started with any new product depends largely on the quality of its documentation. All three systems supply toll-free telephone support, onscreen help, and a printed manual. SilverPlatter's manual, which is arranged in a looseleaf notebook, is the most polished of the three. It is also the only one that contains a tutorial section. Although at first glance this manual appears to cover all the commands, a great deal of information is left out, or is difficult to find, even though it is the only one of the three that does contain an index. However, in all fairness, SilverPlatter has a wealth of information about the system commands, the database you are searching (in this case, ERIC), and search strategy on its many, many help screens, which are function key specific. That is, you may hit the **F1 (Help)** key at almost any point in a search and receive appropriate information. For example, if you are in the **Find** mode when you press **F1**, the help screen will tell you about the **Find** command. There are actually 16 screens about this command.

OCLC's and DIALOG's manuals are still in draft stage, but are both very thorough in explaining how to use the systems. Since DIALOG has two distinct search modes, there is a specific section on each. DIALOG also provides detailed information on the ERIC database. Copies of the DIALOG Bluesheet and database chapter are included. DIALOG and OCLC also provide a shortened brochure or guide for quick facts and tips on how to search. Novice users find these useful since it can be time-consuming and somewhat frustrating to have to sort through the material in the manuals. However, it is very unfortunate that OCLC's *Quick Reference Guide* fails to mention or give a single example of bound descriptors. Our previous discussion of these emphasized how crucial it is to inform users of OCLC's indexing philosophy.

Like SilverPlatter, DIALOG and OCLC have function key specific help. These two systems also have an option for reviewing help screens

available by selecting them from a menu. In many ways, the help screens for OCLC and DIALOG are more concise and easier to follow. Since the choice for help is displayed in a menu, it is easy to locate and use.

Online searching has decreased since installation of the CDROM workstations, especially since ERIC is one of our most frequently searched databases online.

EFFECTS OF CDROM IN THE EDUCATION LIBRARY

Online searching has decreased since installation of the CDROM workstations, especially since ERIC is one of our most frequently searched databases online. From July to December 1985, we ran 322 searches, 157 (49%) of which were ERIC requests. For the same time period in 1986, we did 140 searches, 68 (49%) in ERIC. We cannot say that installation of the CDROMs is the only factor in reduced online searching. Nevertheless, it must be considered as having an important impact. With CDROM technology available in our library, patrons now have the option of searching for themselves for free, or having a search run by a librarian. Our surveys have found that many patrons are doing searches on the CDROM who would not have paid for online searches. We may find online searches in ERIC will focus more on updating the CDROM searches, rather than an exhaustive search of the entire database.

The reference staff has spent much time instructing patrons in the use of CDROMs. Instruction may include a complete overview of the system, as well as help with search strategy, or a simple explanation of a particular function. We spend from a minute or so up to 30 minutes or more with people. Because the workstations are arranged in the middle of the Reference area, we have not held many group sessions for bibliographic instruction. We find we spend much less time instructing students in the use of the printed indexes. Once aware of the computers, most patrons choose to do their research on one of them. The Reference department has not required a scheduling nor set time limits on the use of the CDROM stations this year. Because we may only have two workstations available soon, and many of the search sessions have been so lengthy, we may decide to set time limits in the future. We do not charge for paper to print records, but do require patrons to provide their own floppy disks for downloading. The staff encourages browsing through records first before printing, and recommends saving to a floppy disk if there are several hundred to print.

SUMMARY

All three companies offer a good product with the capability of searching ERIC a bit differently. OCLC's unique use of windows makes it special. The ability to use an expert as well as novice mode with DIALOG OnDisc expands the possibilities for experienced searchers. SilverPlatter's customized formats, while they require some getting used to, do allow for a great deal of flexibility in displaying or printing results. OCLC's and SilverPlatter's prices are competitive while DIALOG's leasing arrangement forces you to pay every year for the same archival disks. We feel confident with the accuracy and comprehensiveness of results from SilverPlatter and DIALOG OnDisc, but OCLC's indexing procedure causes us some concern. The searcher must be well informed on the appropriate way to search in order to achieve the most accurate results.

Now that our trial period is coming to an end, we are faced with the decision of which product to purchase. As far as overall characteristics, we like DIALOG OnDisc best. It is a flexible and powerful system for searching ERIC, both for the novice and the experienced searcher. The capability of updating a search online is convenient and readily available. The OnDisc thesaurus also enables users to easily choose related terms for a comprehensive search. The fact that **PsycLIT** is also available on SilverPlatter, and is another CDROM we are purchasing, makes the decision of which ERIC to buy more difficult. While our users have not objected to having different systems to learn, having only one search technique to teach would simplify the work of the reference staff. We hope to persuade our director to purchase the current ERIC from DIALOG and get the backfile and annual update of ERIC from SilverPlatter. One workstation would then have DIALOG OnDisc only, while another would have ERIC and PsycLIT both from SilverPlatter. ►

We like DIALOG OnDisc best. . .we hope to persuade our director to purchase the current ERIC from DIALOG and get the backfile and annual update of ERIC from SilverPlatter.

We feel lucky to have had the opportunity to carefully compare all three products before making our decision, and hope that our observations may help others facing similar decisions. We highly recommend hands-on demonstrations with any of the products you are considering for purchase. Ultimately the choice should be based on your library's particular budget and needs.

CDROM technology provides another means of accessing the world of literature. It saves time, money, and increases the depth of research for students and faculty. We feel the technology enhances the printed indexes, but should not be viewed as an absolute end. Reference staff must make sure patrons use all reference tools available, not just the computerized ones. We look forward to using CDROM databases in our library and hope to see continued progress in this technology as more products become available.

REFERENCES

1. Herther, Nancy K. "CDROM and Information Dissemination: An Update," *ONLINE* 11: 56-64, March 1987.

2. Alberico, Ralph. "Justifying CD-ROM," *Small Computers in Libraries* 7: 18-20, February 1987.

3. Herther, Nancy K. "A Planning Model for Optical Product Evaluation," *ONLINE* 10: 128-130, September 1986.

4. Snow, Bonnie. "Life Science Sources on Laserdisk," *ONLINE* 11: 113-116, March 1987.

5. "SilverPlatter Releases Hardware/Software Info," *Optical Information Systems Update/ Library & Information Center Applications* 2: 28-29, March/April 1987.

FEATURE	DIALOG ONDISC	OCLC CD450	SILVERPLATTER
SCOPE/COST/TERMS			
Current Disk	CIJE and RIE 1981-present $950/yr. license quarterly updates.	CIJE and RIE 1982-present $675 ($600 member) quarterly updates. **Introductory price $349 ($299 member) quarterly updates. $350 ($300 member) annual update only. Educational Materials in Libraries: An OCLC subset $350 ($300 member) annual update only.	CIJE and RIE 1983-present $650 for quarterly updates. $390 for annual update only.
Archives	3-disk set covers 1966 to present $1650 for Yearly License.	CIJE 1969-81 RIE 1977-81 RIE 1967-76 $350 ($300 member) per disk One-Time Purchase.	1966-82 on 2 disks $900 per set One-Time Purchase **$250/year license fee if current subscription not purchased.
"Package Deals"		Current subscription and archival set $2075 ($1800 member) **Introductory price $1399 ($1199 member).	Current subscription and archival set $1200.
Policy regarding superceded disks	Mandatory return.	Unknown.	Mandatory return.

FEATURE	DIALOG ONDISC	OCLC CD450	SILVERPLATTER
HARDWARE REQUIREMENTS			
	IBM PC or compatible.	OCLC M300XT, IBM PC XT or PC AT or compatible.	IBM PC or compatible.
	384K (640K recommended)	512K.	512K.
	Hard disk with at least one megabyte of free space	10MB fixed disk drive or hard card.	
	Hitachi or Philips CDROM drive, cable, and controller card	Hitachi, Philips, or Sony CDROM drive, controller card, and cable	Hitachi, Philips, or Sony CDROM drive, controller card, and cable
	Printer (optional)	Printer (optional).	Printer (optional).
	Hayes-compatible modem or certain other models and telephone line for online connection (opt.)		
	Color is supported but monochrome monitor will also work.	Monochrome.	Monochrome.
LEASE/PURCHASE OPTIONS			
	Purchase of Philips CDROM reader, controller card and cable: $740 Complete programs for purchasing, leasing, installation, and maintenance are available.	Purchase of Hitachi CDROM reader, controller card and cable: Price not yet set.	Purchase of Hitachi unit with 90-day warranty; $680 paid in advance, $750 by purchase order; with 1 year warranty: $780 prepaid, $850 by p.o. 2-year lease/purchase (prepaid or p.o.) $500/yr. Purchase of Philips unit with 90-day warranty: $760 paid in advance, $830 by purchase order; with 1 year warranty: $860 prepaid, $930 by p.o. 2-year lease/purchase (prepaid or p.o.) $500/yr. *Shipping costs stated at $25 per drive.
SOFTWARE CONSIDERATIONS			
Choice of search modes	Yes	No	No
Free-text searching	Yes	Yes	Yes
Field qualification	Yes	Yes	Yes
Proximity searching	Yes	Yes	Yes
Boolean operations	Yes	Yes	Yes
Index display	Yes	Yes	Yes
Select terms from index without rekeying	Yes	Yes	No

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FEATURE	DIALOG ONDISC	OCLC CD450	SILVERPLATTER
SOFTWARE CONSIDERATIONS (Cont.)			
Ondisk thesaurus	Yes	No	No
Direct record access	No	Yes	Yes
Display formats	4 Predefined	5 Predefined	Predefined or user may define by fields
Sort search results	Yes	No	No
Download to disk	Yes	Yes	Yes
Save search strategy when exchanging disks	Yes	Unknown	Yes
Connect to online service	*Yes	No	No
DOCUMENTATION AND CUSTOMER SUPPORT			
Printed manual	Yes	Yes	Yes
Printed manual WITH INDEX	No	No	Yes
Quick reference chart	Yes	Yes	No
Tutorial	No	No	Yes
Context-specific online help	Yes	Yes	Yes
Toll-free telephone support	Yes	Yes	Yes

* In DIALOG Command Mode

THE AUTHOR

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RAMONA J. STEFFEY received her M.L.S. from Vanderbilt University and previously worked as a Reference Librarian and Engineering Bibliographer in Vanderbilt's Sarah Shannon Stevenson Science Library. Her current position as Automation Project Librarian is a two-year term appointment related to the Enhanced Information Access Project, funded by the Pew Charitable Trusts. In this position, she is coordinating the use of CDROM technologies in all the Vanderbilt libraries and is liaison with NOTIS staff in developing an interface for searching a locally-mounted subset of MEDLINE on Vanderbilt's NOTIS system. She is co-editor of a monthly newsletter for the Jean and Alexander Heard Library's Microcomputer User Group.

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INFOTRAC AT INDIANA UNIVERSITY: A SECOND LOOK

by Ann Bristow Beltran
Head, Reference Department
Indiana University Libraries
Bloomington

In the summer of 1985, members of the Reference Department at Indiana University looked at Information Access Corporation's InfoTrac and asked if this product had the potential to extend some of the benefits of computer-assisted searching to very large numbers of students without placing a crippling burden on the staff. Based on four months of use I reported our positive experience with the product in this journal last June.[1] In Fall 1986, after twelve months of experience with InfoTrac and several formal and informal evaluations of its use, the answer to both our original questions is still a firm yes.

RELIABILITY

The product has proved reliable, the company both responsive and innovative, and user reaction undiminished in its enthusiasm. First, reliability: the hardware and software have proved little short of miraculous. In our environment four InfoTrac stations sit very near a photocopier. The photocopier (three different machines in the past twelve months) is a source of unending annoyance and frustration for patrons and staff alike. It gets very heavy use, but no heavier than the InfoTrac stations which are in constant use the entire 109 hours a week we are open. Not one element of one workstation has failed. The printers provide poor, but legible copy; they have not had any maintenance in twelve months. They just keep silently grinding away. Fairly often a workstation will appear to get caught in some program loop and stand stubbornly still, or occasionally all four will go down. The first situation is almost invariably solved by shutting the station down and bringing it up again. The second problem has proved more than once, to our embarrassment, to be nothing more than a loose cable.

On the few occasions when we have needed quick delivery of a disk or software from IAC we have received it within 48 hours. The authority to respond positively to requests seem widely disbursed within the organization. Usually the initial contact can offer a solution which is acted on, without the need to check or clear the request at some higher level and thus delay action.

RECENT IMPROVEMENTS IN THE PRODUCT

Secondly, regarding innovation and responsiveness: the product is improved and improving. When initially delivered, it was not accompanied by even a *printed* list of the periodicals covered. Version 3.22a has an onscreen list of the publications indexed. Students are still disappointed that we do not own all the magazines cited, of course; but this is a major problem only when their topic has a narrow regional focus which is discussed almost exclusively in one of the city-specific business magazines, of which there are still too many included. Of course, we do not feel this way when the narrow region is our own.

Carol Tenopir, in her review of the product in the September 1986 issue of *Library Journal* quoted "one faculty member in a university library [who] had bigger plans: 'This is great. Now if you can only get the journal article to pop up on the screen.'"[2] Version 3.22a also offers the onscreen full text of articles from the *Wall Street Journal* from January 1986 forward (at additional cost, separate from the basic InfoTrac subscription). I would not be surprised to find IAC moving further in this direction, perhaps eventually replacing their microfilm cartridge Magazine/Business Collection with a fully integrated disk-based product. No looking up call numbers, no feeding of microfilm reels, no discovering the pages ripped out. The students will think we have finally 'got it all together.' The only people likely to be disappointed are those who feel that suffering is good for the soul, and that the library's mission is to provide predictable pain, slowly.

InfoTrac uses Library of Congress subject headings with the liberal addition of their own headings and references, just as they have for years in their microfilm-based products (**Magazine Index**, et al.). I know of no experienced

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user of any index who cannot point to peculiarities in the design and choice of headings in that index, and InfoTrac is certainly no exception. My own (least) favorite was a heading which appeared for several months and which had only three or four entries listed under it: *Gramm-Rudman*. There were of course hundreds of entries in the database on this topic and most of them were buried under a *Budget* heading, I believe. (This is all very approximate and only from memory.) The point I want to make is that this problem was recognized and corrected. (Not because I brought it to anyone's attention; I only complained to colleagues.) The current database (September 1986) has a *see* reference from *Gramm-Rudman-Hollings Act* to the *Balanced Budget and Emergency Deficit Control Act of 1985*, where the great mass of information is well divided under more than a dozen subheadings.

USER REACTION

The third point I mentioned: user reaction, continues to be overwhelmingly favorable. Several surveys, questionnaires and interviews conducted in the Reference Department and in the Undergraduate Library have offered abundant "proof" of the obvious. In several of these efforts we tried to address a question which concerns us, and which I mentioned in my earlier report: are some students choosing not to use the index because it involves the use of machines they are unfamiliar or uncomfortable with? Though it seems likely this may be the case for some, we were not able to measure or evaluate it to our satisfaction. I suspect we may have passed the day when people will readily admit to these feelings, even to a gentle interviewer.

Undergraduates are the heaviest users of InfoTrac, and its most enthusiastic supporters. For a decade academic libraries have been offering sophisticated computer-assisted searching of an increasing number of databases. Undergraduates have benefited little from these efforts, for a variety of reasons. InfoTrac is the first computer-assisted information service to reach literally thousands of students on our campus. They appreciate the service, and I believe that matters a great deal. In this, I recognize that I am not in full agreement with a number of professional colleagues; one of them, speaking at an ALA preconference, expressed his conviction that InfoTrac did in fact draw students to the library and did save their time once they got there but what, he wondered, were they doing with that saved time?[3]

Some undergraduates are fairly naive and do not have great intellectual energy. Both these conditions lead to a too easy acceptance of any ►

SOFT

. . . The Quickest Way To Find The Microcomputer Software That Precisely Meets Your Needs

File SOFT is a database of microcomputer software specifications and descriptions. Using it, you can enter a wide variety of software requirements – such as Type of Application . . . Cost Range . . . Hardware Requirements . . . Operating System . . . and Producer Name.

Example: You want to find the names and specifications for "all integrated programs that combine word processing, creation and management of a database, plus spreadsheet analysis" and runs on a minimum of 256K on an IBM or IBM compatible micro. You also want the ratings (on a scale of Poor to Excellent) that various reviewers have given the programs that are found. Such a search would take 1 minute, 40 seconds and yield four hits that exactly meet the requirements: "INTUIT," "ELECTRIC DESK," "SMART SOFTWARE SYSTEM," AND "AURA."

File SOFT is mounted on BRS and contains records for over 5,000 micro software packages. The database is particularly popular with programmers, themselves, because of the wealth of data in the records and the many access points.

To use File SOFT, simply log on to BRS and type in SOFT as the file name. If you do not have a BRS password, write or call BRS, 1200 Route 7, Latham, NY, 12101, telephone 800-833-4707, in NY 800-553-5566.

one information source as definitive. How many reference librarians have offered guidance to the student who, after five minutes turning the pages of the *Reader's Guide*, announced in despair that nothing has ever been written on his topic? The same kind of guidance is called for in assisting those who use InfoTrac. They need to understand the nature of the body of literature they are searching and its appropriateness to the "research" in which they are engaged. The intention in our library is to clearly present InfoTrac as one of several available indexes to *popular* literature, one which uses technology to make the process of searching that literature easier and faster. Obviously InfoTrac does not diminish the librarian's important role as a guide to *when* and *why* to use a given index. It does, to a remarkable degree, lift the burden of repetitively demonstrating *how* to use the tool.

Obviously InfoTrac does not diminish the librarian's important role as a guide to *when* and *why* to use a given index. It does, to a remarkable degree, lift the burden of repetitively demonstrating *how* to use the tool.

In addition to undergraduates, graduate students and faculty have also expressed their approval of the system. The graduate students often add their disappointment that nothing comparable (and as readily available) exists for their own scholarly literature. One faculty member whom I know by sight offered me a useful lesson. Seeing him sit down at one of the workstations, I quickly moved in to explain, rather defensively I fear, that we were soon expecting the arrival of scholarly databases on similar kinds of optical products. He explained to me that the biology librarian had searched **BIOSIS** and **PsycINFO** for his topic, and he was using InfoTrac to get an idea of its treatment in the popular literature; it was a very satisfactory index, he observed. More than one faculty member has also given us indirect evidence of their acceptance of the service by specifically assigning their students to use it.

THE FUTURE

Information Access Corporation has been first into the field of optical publishing with what I believe to be a first rate product. It has been, however, a product with virtually no competition. That appears to be about to end. Direct competition, in the form of an optical product from the H.W.Wilson company offering access to *Reader's Guide* and their many other indexes is on the horizon. Indirect competition, in the form of CDROM-based versions of important databases such as **ERIC** and **PsycLIT** from SilverPlatter are already here. The effect of these competing sources, most on CDROM with considerable (promised, but not demonstrated) compatibility, most marketed without equipment costs built in, and most offering software incorporating the wide range of search options available in online systems will be interesting to watch, and will present some immediate difficult choices for libraries.

In the Reference Department at Indiana University, Bloomington, for example, it seems likely at the moment of writing these remarks that we will not renew our subscription to InfoTrac when it expires in December. This is obviously, from the report offered here, not because we are dissatisfied with InfoTrac. The costs of optical information systems and our desire to make the best products immediately available to our students and faculty are simply forcing us to a (probably very desirable) tighter practical interpretation of mission and responsibility. If InfoTrac is of greatest utility to undergraduates, we have to recognize that we share a main library building with a wing devoted to undergraduate services and that it is the mission of that unit to evaluate and offer the best services to that user group. They are also subscribing to InfoTrac; and intend, at this date, to continue their subscription and increase the number of available workstations. In the Reference Department we will be moving on to indexes important to our primary users, offered or about to be offered, by SilverPlatter, Bowker and University Microfilms. If our first year's experience with these optical-based indexes is as positive as our experience has been with InfoTrac we will count ourselves very lucky indeed.

NOTES

1. "Use of InfoTrac in a University Library" *DATABASE* 9,3 (June 1986)63,66.
2. Tenopir, Carol. "InfoTrac: a Laser Disc System" *Library Journal* (September 1, 1986)168-169.
3. Similar attitudes and a critical assessment are also expressed in Van Arsdale, William O. and Anne T. Ostrye "InfoTrac: A Second Look" *American Libraries* (July/August 1986)514-515.

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PUTTING ON A SHOW: USING COMPUTER GRAPHICS TO TRAIN END-USERS

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END-USER TRAINING AT PENN

The Libraries of the University of Pennsylvania have been offering end-user searching for several years. Lippincott Library of the Wharton School began training students to do their own searches in September 1985, and Van Pelt, the main library, in April 1986. Both used a lecture format with transparencies. We teach the basic principles and strategy of searching BRS/MENUS. Most attendees are graduate students, although sessions are open to undergraduates as well. After attending the training sessions, students are eligible to search most BRS/MENUS databases at a heavily subsidized rate on the libraries' equipment (terminals or PCs).

When the libraries purchased a Sony universal video projector, an IBM PC with a graphics card, and a color monitor, we wanted to use this new equipment to enhance our end-user training. The video projector projects the contents of the PC monitor's screen onto a larger surface. While we would continue to teach through a lecture format, the new equipment would allow us to replace the transparencies with an animated, more colorful visual aid. It also would provide a means of simulating an actual online search, since it is impractical for us to offer hands-on training to groups.

DETERMINING OUR SOFTWARE NEEDS

The first step in creating the new end-user session was selecting a software package. We wanted:

- variety of colors and shapes
- ability to do free-hand drawing
- availability of pre-drawn graphic images

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- ability to combine text and graphics easily
- ability to include downloaded searches
- capability for movement and animation
- ability for trainer to control pace
- ease in booting and running finished program
- ease in updating program
- ease in learning software

Because many staff members are involved in training, we wanted everyone to be able to run the program without extensive knowledge of the software. We also hoped that other members of our departments would ultimately use the software for other training sessions. Therefore, we did not want a package that was difficult to use or learn. We ourselves had less than three months to learn the software and develop the presentation.

PC STORYBOARD TO THE RESCUE

We learned of a graphics package called PC STORYBOARD. We were impressed by its demonstration program. The colors were bright and attractive and the animation added interest. The manual appeared well-organized and included a tutorial. The software allowed downloaded searches to be included in the presentation. It seemed to meet all our requirements. The price, $295.00, seemed reasonable and was within our budget.

A subsequent online search of **Microcomputer Index** for IBM graphics packages turned up several references to charting packages, as well as a few citations for expensive ($3000+) animation packages such as LUMENA. There were also several citations to PC STORYBOARD and the brief abstracts indicated favorable reviews from such sources as *PC World, PC Magazine,* and *Personal Computing.*[1] We didn't see any other software packages listed whose descriptions matched our requirements. There is a similar package for the Apple Macintosh, called VIDEOWORKS, which offers fairly sophisticated graphics and animation, but in monochrome rather than in color.

LEARNING THE SOFTWARE

The PC STORYBOARD package includes one user's manual and three disks containing the demonstration and software. PC STORYBOARD has four modules:

- **Picture Maker**—to create screens
- **Picture Taker**—to incorporate data from other files
- **Story Editor**—to put the screens together
- **Story Teller**—to run the presentation

Learning PC STORYBOARD was easier than we expected. The documentation that comes with the package is clear. A tutorial section introduces you to the basic commands, but you can plunge in and begin drawing your own screens, using the reference section and index to look up commands as you need them. Until you become familiar with the sequence of keystrokes for each operation, however, picture creation can be slow.

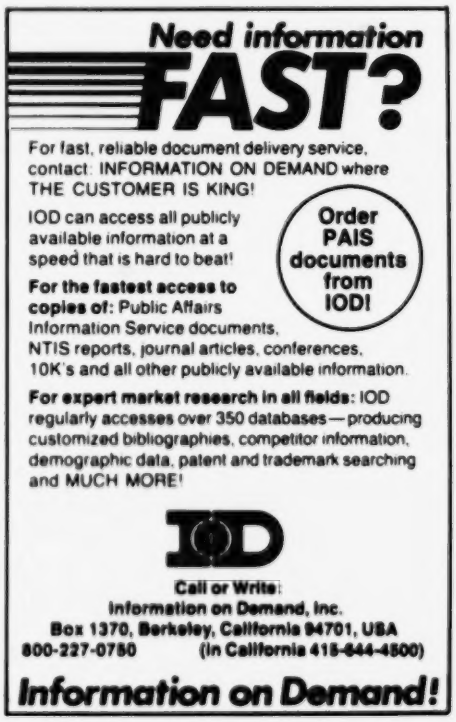
CREATING SCREENS

Picture Maker lets you create your screens. The software does not support a mouse attachment, therefore, all picture creation is done using the cursor. Cursor speed is adjustable.

PC STORYBOARD has two major color palettes, cyan/magenta/white and green/red/yellow. Two-color patterns as well as solid colors are available. You can compose in one palette and change to the other when you are ready to present the picture. In our final presentation, we alternated the palettes for variety.

Four different fonts, in five different sizes, are available for text. You can also outline and shadow each letter in matching or different colors. Text is first typed at the bottom of the screen you are designing and then incorporated into the picture.

PC STORYBOARD is command driven. In addition to the command for drawing lines, there are also commands for drawing boxes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and circles. It is easy to remember commands because they are generally the first letter of the name of the command, such as D for drawing lines, B for box, E for erase, and U for undo. Undo allows you to cancel your last operation. Many of our pictures were redeemed from misstrokes by this command.

The way of choosing an option is one of the most appealing elements of PC STORYBOARD. You choose colors, font sizes and other elements by rotating through the choices. You do not have to remember the possibilities.

PC STORYBOARD has two picture libraries, each of which contains dozens of images. Pictures that we used included a light bulb, a telephone, a book, and a PC.

CAPTURING DOWNLOADED SCREENS

Picture Taker allows you to use material that was not created in Picture Maker. For example, you can include a Lotus 1-2-3 chart in your presentation. We used Picture Taker to incorporate a downloaded search.

PUTTING THE STORY TOGETHER

With Story Editor you can put the screens together in the order you want, thus creating your own story. The story can be any length, since you can store screens on several disks if necessary. You designate the method, direction, and pace of screen changes, as well as colors. You can designate a time delay between screens or delay the change with a keystroke, which lets the trainer control the pace of the session. Different portions of the screen can display at different times, which produces the effect of animation and movement. This enables you to focus on the point that you are currently making, and aids in keeping your audience's attention. One of our favorite uses of this feature is in our flow chart of "The Online Process." By having each element appear sequentially in clockwise fashion, we are able to create a "flowing" chart that effectively communicates movement and direction.

Experimenting is easy in Story Editor. You can run the story from any point in the program and stop it at any point and then change your instructions. As in Picture Maker, options are easily selected by rotating through the possibilities.

TELLING THE STORY

Once you've put a story together, it is ready to be told with Story Teller. This module lets you run the software and your story in one command without knowing the intricacies of the PC STORYBOARD software. Once the story is running, you can move forward by pressing almost any key (or by waiting for the time clock, if that is how you designated the delay in Story Editor). You can temporarily stop the session at any time by pressing escape, and from there exit the program or resume the story. You can easily go backwards one screen or more and then return immediately to the latest screen displayed.

CONTENTS OF OUR PROGRAM

We spent a total of six weeks learning the software, creating screen files and putting together a 45 minute story. Our goal was to create a presentation that could be used by Van Pelt and Lippincott libraries. Lippincott modified the basic presentation to include two other systems, Dow Jones News/Retrieval and DIALOG Business Connection.

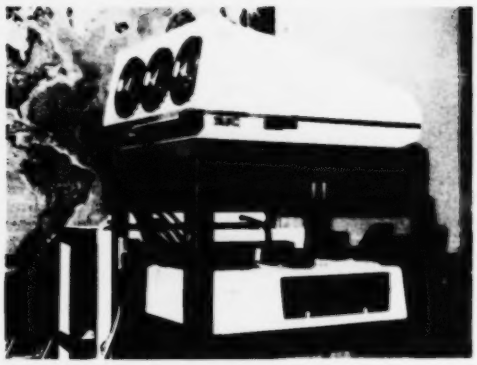
Topics covered in the session, which emphasizes bibliographic databases, include:

- computer systems available in the University Library System (including laserdisk, in-house and time-sharing systems)
- types of databases available from commercial producers (bibliographic, full text, numeric, directory)
- the online search process, illustrated by a flow chart
- advantages and disadvantages of online searching
- structuring an online literature search, including a step-by-step example
- logical and proximity operators
- parts of a citation and field qualification
- truncation
- broadening and narrowing search strategies
- displaying documents and format choices
- summary of commands
- a sample downloaded search

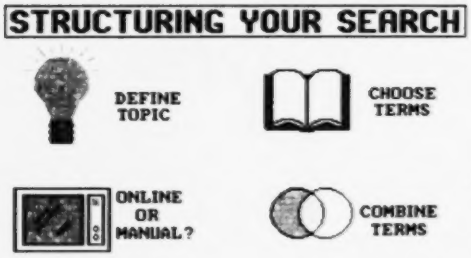
AUDIENCE'S REACTION

We have been using the video display in training sessions since late August 1986. The first three presentations were made to groups of about 100 first-year MBA students as part of a computer literacy course. Attendance at regular weekly training sessions ranges from two to 30 people. Several graduate-level subject bibliographic sessions have included end-user training. Some trainers followed the session with a live demonstration on the PC and projector. Over 500 students have viewed it as of the end of October 1986.

Reaction to the video presentation has been overwhelmingly positive. Students seem to be



An IBM PC and Sony universal video projector are used in end-user training sessions.



The light bulb, book and terminal monitor images are from PC STORYBOARD's Picture library.

impressed with the library's use of such a "high-tech" audio-visual aid. Trainers believe that students are more attentive to the video display than they had been to the overhead transparencies.

This impression is reinforced by written comments on surveys Lippincott distributed after the training sessions. Trainers received many compliments on the program. Several students were so impressed that they inquired about using the package for their own in-class presentations.

A comparison of student responses to sessions over the summer, when transparencies were still used, and to presentations using the new computer graphics, suggests that the students found the video display more useful. Seventy-nine percent of the students who were trained during the summer agreed that the overheads were useful. Eighty-nine percent of the students who were trained as part of their computer literacy course felt the video display was useful, and 88% of those trained in smaller regular weekly sessions agreed with that statement. Because students were exposed only to one medium and not the other, a direct comparison is not possible.

Another indication of effectiveness of the video display is the students' overall rating of the session. The percentage of students rating the regular weekly sessions either "excellent" or "very good" (as opposed to "good" or "fair") went from 61% for the transparency presentation to 76% for the video presentation. Since the contents of the presentations are fairly similar, at least some of the increase in ratings can be attributed to the video display.

ADVANTAGES OF PC STORYBOARD

Simulating online searches is one advantage of using a program such as PC STORYBOARD for online training. Because of telecommunications problems and system downtime, offering live demonstrations is often impractical, as well as expensive. Many students, however, expect the training session to include an actual search, if not hands-on experience. Being able to capture a downloaded search and display it one step at a time provides the illusion of real-time searching.

Another advantage is the ease with which the presentation can be updated, expanded, or customized for specific applications. Once you have created a basic set of images, you can rearrange, delete, and add to them as your situation warrants.

DRAWBACKS TO THE VIDEO PROJECTOR

Several problems may arise, however, in using the projector. For best viewing, the room should be completely dark, thus preventing students from taking notes. Some trainers reported feeling claustrophobic in a completely darkened room or uncomfortable teaching as a "disembodied voice." We found that we could turn on small lights behind the screen if necessary. Also, some people find it difficult to view the projected image for long periods of time. Some trainers have developed headaches by the end of the session.

ALTERNATIVES TO THE PROJECTOR

It isn't necessary to own or purchase an expensive video projector in order to take advantage of the colorful graphics and text that such a package offers. Several other potential applications for the end-user training environment suggest themselves.

The presentation can be shown directly on a PC rather than being projected to a large group. An individual could view it at his own ►

pace. You could develop a session which simulates an online search, by prompting the viewer to hit a key when ready to advance to the next segment. Story Teller can allow viewers to select options from the screen, although this process requires more complicated programming.

A taped narrative could accompany the presentation. It could be timed to move along as the screens change (using the computer clock rather than the "wait for key" mode). Individual students could be trained whenever they wanted, rather than just when the library offers a formal group session. You could also let students review the training session on their own. This could be especially useful when some time has elapsed between the lecture and their first online search.

Presentations could be designed for advanced topics or training on other systems or subject areas. At Lippincott and Van Pelt, we are just beginning to explore these applications of PC STORYBOARD.

Individual screens created with the program can be transferred to other media, such as videotapes, slides, or paper. If you have a color printer or ink plotter, you can produce colorful signs and handouts. If you don't have a PC available for demonstrations and training, you might prefer to design the presentation using a PC, but present the material using more traditional means such as a videotape or slide show.

We believe that using PC STORYBOARD and the video projector has enhanced our end-user training. The software/hardware configuration is easy to learn and operate. We recommend that institutions involved in training consider PC STORYBOARD for this and other applications.

1. For reviews of the software, see McComb, Gordon, "Good Show, IBM," *PC World*, February 1986, pp. 202-207; Wirtman, Leon A., "Storyboard is remarkable aid for animation, special effects," *InfoWorld*, October 7, 1985, pp. 38-39; Burns, Diane, "PC Storyboard business graphics get moving," *PC Magazine*, October 29, 1985, pp. 163-166; and O'Mally, Christopher, "First class showmanship," *Personal Computing*, June 1985, pp. 172-174.

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SEARCHMASTER — PROGRAMMED FOR THE END-USER

by Kenneth R. Walton
Exxon Research and Engineering Company

INTRODUCTION — A RETROSPECTIVE

There has long been a strong interest at Exxon among the technical professionals to do their own online searching. This interest was clearly recognized by the Research and Engineering Information Support group about five years ago during a joint study[1] of IIDA (Individualized Instruction for Data Access) with Drexel University. IIDA was a computer-mediated search system for end-users for which about 100 Exxon scientists and engineers were needed to search online. There was no problem in finding volunteers for the study. In fact, a number of people had to be turned down. The final conclusion of the study was that IIDA was an interesting test vehicle but not suitable as an everyday, practical end-user search system. For us the utility of IIDA became a secondary concern compared to the high level of enthusiasm for online searching which it both surfaced and generated. The question was how could we satisfy the demand for end-user searching.

At about the same time that the IIDA test was conducted, the searching staff had developed and taught training courses in online searching to end-users at Exxon sites with small or non-existent information centers and no technical searchers. These end-users by necessity learned to search with some success, which along with IIDA, encouraged us to try some small-scale training courses with our local researchers. Two training courses were conducted, one for the Elastomers Technology Division (ETD) of Exxon Chemical Company in 1981 and one for a group of analytical chemists in 1982. The courses were well documented and included the collection of feedback and online usage statistics from the end-users.

As reported elsewhere[2], the results of the training were initially encouraging. Of the four participants whose primary goal was to do their own searching in the ETD class, three actually did so at least once during the year following the course. One of the four analytical chemists who wanted to search did so during the year after their course. This is an overall success rate of 50%. However, it turned out that one of the three users in ETD accounted for nearly all of their usage. Thus, if one adds

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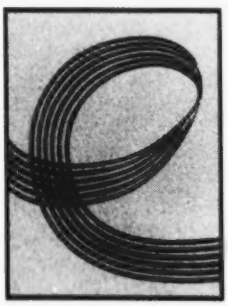
the analytical chemist, only two people were actually searching to a significant degree—a practical success rate of 25%. A recent check of searching activity revealed that no one in either group has done a search during the past year. The long term success rate is thus effectively 0%.

SEARCHING—A NONTRIVIAL ACTIVITY

Admittedly the searching staff did not make any formal effort to help the course trainees maintain their skills over the long term. Perhaps this would have made a difference, but probably not. There is a more compelling reason to account for the failure of end-users to search online directly without some type of user-friendly aids: The effective use of online systems geared for professional intermediaries is a nontrivial activity for the novice or the dilettante. The search process provides a host of challenges to the end-user. First there are the procedural and mechanical challenges. The end-user must know the logon protocol which usually includes memorizing telephone numbers, user IDs, and miscellaneous other codes. Once logged onto a system, he must be familiar with the command system and Boolean search operators. It is also immensely helpful to have typing skills, since a typical search can easily require one hundred or more keystrokes. These challenges alone have been sufficient to deter many end-users from online searching.

The mastery of the procedural challenges, a significant barrier in and of itself, pales in comparison to the intellectual challenges of the search process. Once on the system, the end-user must choose the most appropriate database to search and then devise the proper strategy. Database selection alone can be difficult. DIALOG, for example, lists in their 1985 catalog 20 databases covering social sciences and humanities and 17 databases on energy and the environment. How are the databases in a given area unique? Knowing that, which one offers the best chance of retrieving the needed information?

In some cases, the choice of a database is straightforward. For most chemical questions, for instance, **Chemical Abstracts (CA)** would be the easy and logical choice. Searching CA, however, is not easy. CA is a highly structured technical database with a controlled vocabulary, Registry numbers, subject codes, and so on. Strategies consisting only of natural language terms (keywords)—a favorite gambit of end-users—can be a fatal error on structured databases like CA, especially when comprehensive subject retrieval is the goal. An intricate knowledge of database structure and of how that ►



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structure has evolved with time is essential to productive searching.

Time and practice are obviously required to develop and maintain the intellectual skills needed for effective searching. Many end-users simply do not have the time available to acquire and maintain the skills. Searching is after all a secondary activity for end-users. In the case of Exxon, the end-users are scientists and engineers who by necessity must devote most of their time to their research and development activities.

PROMOTING END-USER SEARCHING

It was this type of reasoning which led the searching staff to abandon in-house training courses as a means of promoting end-user searching. We adopted an informal policy of sending the few highly motivated end-users out to the search services for training. If, after receiving the training, they were still interested in searching, we provided them with user IDs and handled the billing. We also provided assistance in selecting the necessary hardware (i.e. terminals, printers, and modems). Of course, the problem with this approach was that only a small fraction of the end-users who wanted to search was accommodated.

With the hope of attracting more end-users to search, we began to investigate user-friendly, front end systems in early 1985. It was believed that end-users could ably perform many routine searches with a front end that eliminated or eased the challenges of online searching described above. We sought a front end system which would overcome essentially all of the procedural problems. The system would have to automatically log the user on and off and require no knowledge of protocols, user IDs, and telephone numbers. To minimize keystrokes and make it attractive to non-typists, the system would preferably be menu-driven.

The system would also have to restrict significantly the choice of databases and the development of search strategies by the end-user. Because a front end system would be offered initially as a pilot program to scientists in Exxon's Corporate Research Division, we wanted to limit searching to the Chemical Abstracts and **INSPEC** databases—the two files with the most relevance to CR's research interests. The package would be used for highly-structured routine searches—author searches, reference verification, and simple subject searches using keywords for browsing. Systems such as BRS/BRKTHRU were rejected for use because the menu provides too wide a choice of databases and no structure for the search strategies. We wanted a system in which the strategy (i.e., the Boolean logic) for each type of permitted search is preformulated; a search template, if you will. The end-user's involvement would be limited strictly to the choice of terms appropriate to the selected search.

ENTER SEARCHMASTER

These requirements led us to SDC's SearchMaster package. SearchMaster provides for the automatic dialup and logon to four major databanks (ORBIT, DIALOG, BRS, NLM) using Telenet, TYMNET, Datapac or UNINET. It additionally has a simple command language (Script) which can be used to write menu-like programs to perform routine searches on specific databases.

Initially two programs were written for use on SearchMaster—author searching and reference verification for use on ORBIT's CA databases. These were developed in close cooperation with a Corporate Research committee composed of scientists and managers whose general responsibility was to monitor and evaluate information services. In subsequent weeks, subject searching programs for use with CA and INSPEC and a Registry number retrieval program for use with the **CHEMDEX** files were added. This article presents a look at these searching programs and an examination of the statistics for the first six months of their use. The impact of the significant end-user searching activity on the amount and kind of searching by the intermediaries is also examined.

The introduction of the SearchMaster-based programs for end-user searching was accompanied by both advertising and incentives to attract end-users. The service was described as easy to learn with no prior experience necessary and with no charge and no time limit for the first use. The response to the service was immediate and enthusiastic. The first four demonstrations were attended by 12 individuals. During 1985 the system was used by 67 people in 203 online sessions with a usage of 87 connect hours. The usage statistics are described and evaluated in detail in Section 4. It is evident from the numbers that the SearchMaster programs have been widely accepted and regularly used by the research staff.

PROGRAMS ARE EASY TO WRITE

The two end-user programs to be available from the start were AUTHOR and REFER. Executing in the ORBIT CA files, AUTHOR finds the publications and patents for a specified author, and REFER is used for reference verification (i.e. find the full citation to a reference by searching title and author, author and co-author, two title words, etc.). These two programs were written first, because they were believed to be the most frequently requested

routine searches in the Information Center. Furthermore, it was realized at the beginning of the project that author and reference searches involve reasonably simple, foolproof search strategies. There is usually no need to refine the initial strategy; either it retrieves the reference or not. Thus, the author and reference searching programs were found to be relatively straightforward to write. As an additional benefit, the experience gained from writing these programs later proved useful in minimizing the writing and debugging time required for the other programs.

Within a few days of the introduction of the service it became obvious from the feedback of end-users that there was a great demand for subject searching programs. In response to this, the BROWSE program was quickly written and introduced during the second week of service. BROWSE retrieves references from CA on subjects which can be defined by a combination of two concepts, where each concept may be described by up to two keywords. BROWSE was quickly followed by BUZZ (short for buzzword), which searches subjects on CA defined by a single concept, also described by one or two keywords. In the Fall, again as the result of client feedback, PHYSBROW and PHYSBUZZ—subject searching programs for use on INSPEC—and REGISTRY—a Registry number retrieval program for use on the CHEMDEX files—were introduced.

EQUIPMENT AND INSTRUCTION NEEDS

The seven programs are available via an IBM PC located in the online searching room in the Information Center. The PC is equipped with a Hayes Smartmodem for automatic dialup, and an Epson FX100 printer. The telecommunications operate at 1200 baud, so that a Practical Peripherals 128K microbuffer is attached to the Epson to prevent data loss during long prints. Two diskettes are used. The SearchMaster diskette is in the primary drive supervising the entire searching process from logon to logoff. The seven end-user searching programs are maintained in a separate diskette. Extra sets of the two diskettes are also available for the personal use of researchers on their office PC's. (They must, of course, have IBM or IBM-compatible equipment.) Through the end of 1985, two researchers have obtained their own sets of diskettes. They were both provided with individual passwords via the Information Center's SDC account.

The IBM PC is available for the exclusive use of end-users during normal working hours. A login sheet, a system "pocket" guide and a user's guide are located next to the terminal. The login sheet is used for the collection of usage statistics and the appropriate billing of the searching costs to users. The pocket guide offers step-by-step instructions for the user on how to logon to the system and start execution of a search program. After execution is initiated, the menu-driven programs themselves lead the user through the rest of the search. The pocket guide has proven to be quite effective in guiding first-time users through the programs, with minimal assistance from an expert on the Information Center staff. The expert instruction consists of an initial five minute overview of the programs and the process, followed by directions to consult the pocket guide. Further assistance is usually necessary. End-users searching for the second time do not generally require any help unless something "unusual" occurs such as a telecommunications breakdown or hitting the wrong key in response to a menu option. In fact, the more experienced end-users have been observed teaching first timers to use the programs. In the event of major failures, expert help is available.

The user's guide is a compilation of technical notes that were issued during the course of the year to provide suggestions for improving the retrieval of subject searches and to provide guidelines for the use of REGISTRY. A technical note for BROWSE and BUZZ describes the use of CAS Registry numbers as keywords, keyword truncation, and keyword proximity ((w) operator only) for enhancing retrieval. Similarly, a technical note for PHYSBROW and PHYSBUZZ describes the use of truncation, proximity and British spelling. The note for REGISTRY outlines the procedure for finding Registry numbers and shows by example the value of Registry numbers in subject searches on BROWSE. CA's policy of indexing references with Registry numbers is briefly described as well as the high level of specificity involved in the assignment of Registry numbers to chemical compounds (e.g. unique numbers for a compound's geometric isomers, stereoisomers, and isotopic isomers).

THE SEARCHMASTER PROGRAMS—A CLOSE LOOK AT THE BROWSE PROGRAM

Since each program executes in roughly the same manner, the examination of the details of only one program is sufficient to illustrate the general structure and execution sequence for all seven. Figure 1 shows the key portions of the user-program interaction sequence that appear on the CRT screen during the execution of a BROWSE search* to find references on the Raman spectroscopy of methane.

At the A> (the primary prompt of the IBM ►

* Details of the execution of the other six programs are available upon request from the author.

PC's DOS programs) the user enters **RS** (for RunSearch) to initiate the automatic telephone dialup and logon. At the completion of the logon the user enters **&RUN BROWSE** at the **?**, the SearchMaster prompt. The program begins execution by displaying an introductory message specifying the type of search that will be done, the database to be searched, and the data required of the user for input (see Figure 1a). It also reminds the user that the program is intended only for browsing (i.e., to find a few good references) and not for comprehensive retrieval. The next step is data entry. Two keywords are used for the chemical compound, **methane** and **CH4**, and one keyword for the technique, **Raman**. Note that since a second keyword is not specified for the technique, **no word** is entered (Figure 1b).

Next is the selection of the time period in which to run the search. Option 1 is chosen (Figure 1c) covering 1982-forward with a subsequent opportunity to continue the search in earlier time periods. The search, executed in File CAS82 using the LINK operator, retrieves fifty-one references (Figure 1d). The user chooses to print the first ten references to check for relevance (Figure 1e), after which the printer is enabled by the program and prints them in standard format (Figure 1f).

The user is then given the opportunity to print the remaining references, assuming a review of the first ten shows them to be relevant, or to end the print mode (Figure 1g). He chooses to end printing with the first ten and logoff the system (Figure 1h).

It is emphasized that the general execution sequence described for BROWSE is repeated in the other searching programs: (1) an introductory message describing the search to be performed, (2) data entry, (3) the database selection (usually by specifying the time period), (4) search execution and reference retrieval using a preformulated strategy, (5) printing the references, (6) options to execute the search in other databases, and (7) logoff.

SOME GENERAL COMMENTS

The most important characteristics of the programs are that they are quick and easy to learn to use and yet have sufficient flexibility to permit the execution of a wide range of routine searches. The heavy use described in the following section attests to this. At the same time, the relative simplicity of the search strategies used in the programs prevents end-users from attempting complex information retrieval, or, in other words, minimizes the chances of them "getting in over their heads."

From the perspective of the programmer, the job of writing the programs is simple as well. The ORBIT Script language is a small set of commands that permit one to write fairly sophisticated menu-driven programs with decision branches. In each program the seven execution steps just described appear as subroutines (or modules); the main program serves principally to call up and execute the modules in the proper sequence. The modules for any given program are, with small modifications, interchangeable with the corresponding modules in the other programs. In fact, the logoff module is identical for all seven programs. It was this interchangeability which permitted a sharp reduction in time spent writing and debugging the programs, once the initial ones, AUTHOR and REFER, were operational.

Unfortunately, the simplicity of the Script language and the SearchMaster system in general is in certain ways detrimental to the execution of the programs, too. During program execution, the CRT screen is filled with information of no value whatsoever to the end-user. This includes the entire logon sequence (e.g. the display of the phone number, the login ID, the introductory messages from SDC, etc.), the user prompts to continue or cancel searches that appear when highly posted terms are searched, and the logoff sequence where the entire search session is displayed and a request to delete or save the session appears. The display of this extraneous information so familiar to the intermediary often confuses end-users, especially the first couple of times they use the programs. The capability to suppress and optionally replace all these status messages and user prompts would be a welcome one. For example the entire sequence of logon messages which currently appear could be replaced with this: *SearchMaster is in the process of logging onto the search system. Proceed with the search only after a ? appears as a prompt.* Another example would be the capability to replace the standard SDC statement **SS PSTG (3)** with *The search has retrieved 3 references.*

END-USER SEARCHING ACTIVITY – 1985 STATISTICS

The SearchMaster-based programs have been responsible for the first significant and sustained use of online searching by large numbers of end-users at Exxon. Some of the characteristics and patterns of the usage for 1985 are revealed in Figures 2-6. Figures 2 and 3 are bar graphs showing the connect hour usage and number of users respectively for each month. The graphs also distinguish between first time and repeat activity. Several features of the graphs deserve comment. The totals for June are low because the service was introduced on June 19th, thereby limiting its availability to only eight working days. July, the first full month the service was operating,

better reflects the high level of interest and activity among the end-users. The highest number of first time users was recorded for July, and, not surprisingly, July was the month during which the service was the most heavily advertised.

From October forward, the repeaters were clearly dominant in both the number of users and hours of usage. The dominant activity by repeat users for the last quarter of the year was expected. The pool of potential first timers can only grow smaller as time passes, and conversely the number of repeaters can only increase. Eventually the number and activity of first timers is expected to become negligible (<5%), as the pool from which to draw them narrows to new employees and hard-core procrastinators.

Most importantly, Figures 2 and 3 show a sustained use of the SearchMaster programs during the entire time of their availability. The averages for the October-December period (by which time a "steady state" of activity has hopefully been achieved) are approximately 16 connect hours and 22 users per month, strong evidence of an accepted, successful program.

Figure 4 is a distribution of users according to their number of search sessions for 1985. There is nothing surprising here. Most individuals have used the system only once, but there is a core of people who use the system quite regularly. It is important to note that in an October survey of users indicated that those who have used the system only once, only have needed it once. They generally found the system to be user-friendly and would use it again if necessary. The high percentage of one-time use was *not* a reflection of dissatisfaction with the system.

Figure 5 illustrates the distribution of usage by the type of search performed for the October-December time period. Uses of BROWSE and BUZZ are shown together as subject searches on CA (CA Sub) and likewise for PHYSBROW and PHYSBUZZ (INSPEC Sub). The other two entries are author searches (CA Au) and reference searches (CA Ref). Searches on REGISTRY, which was available only from November forward, are not included. Qualitatively, the usage of REGISTRY has been quite small, similar to the usage of INSPEC.

Nearly all of the usage has been with the programs that search Chemical Abstracts. This is a reflection of the chemical orientation of much of the work in Corporate Research and of the fact that most of the programs run on CA. Author searching on CA accounts for almost half of all the searches with subject searching a close second. Together they account for over 80% of the usage.

As stated early on, one of the purposes for offering the SearchMaster programs to end-users was to relieve the intermediaries in the Information Center from the burden of routine searching. An author search is a classic example of a routine search. It is gratifying to see that author searches were the most common search done by the end-users. On the other hand, reference verification is also a routine and common information request so that it is both surprising and disappointing that REFER was so little utilized. The probable explanation is that reference searches are simply not required as often as first supposed.

As an assist to addressing the question of whether or not the end-user searching programs have had an impact on the intermediaries' workload, Figure 6 plots the number of intermediary work requests and the number of end-user sessions for each month. From October forward the number of end-user search sessions exceeds the number of search requests for the intermediaries. In addition, the reference librarian, whose requests are *not* part of this data, observed a significant drop in requests for author searches during the same period. The data strongly suggest that there has been a decrease in the number of routine search requests for the intermediaries. It is difficult, however, to gauge the magnitude of the decrease. The end-user activity has two major components: (A) searches which previously would have been done by an intermediary, and (B) new searching activity generated solely because of the availability of the end-user programs. The relative contributions of components A and B to the total number of end-user searches is unknown. All that can reasonably be said is that component A, which represents the decrease in intermediary requests, is some number of searches greater than zero.

The final question to be asked is whether or not the end-users are too ambitious in their use of the SearchMaster programs; that is, are they attempting to do comprehensive subject searches? There is not sufficient data to answer this question decisively. The average activity and cost of a search in 1985 were relatively low (see Table I), suggesting little or no abuse. It is hard to conceive, for example, of none but the most naive end-user trying to do a novelty search in under thirty minutes in only one database. Informal discussions with end-users suggest they are aware of the system's and their own limitations. There have also been several occasions where end-users have consulted with the searching staff on the appropriateness of using BROWSE or BUZZ for certain subject searches. Generally speaking then, it appears that the usage of SearchMaster is reasonable and appropriate, but some misuse cannot be ruled out. ►

CONCLUSION

To conclude, the SearchMaster programs have proven to be both popular and useful, permitting end-users with no previous experience to perform routine searches online with virtually no assistance. At the same time, it has relieved the burden of routine searching for the Information Center's searching staff allowing them to focus on more sophisticated information problems. This is not to say that the SearchMaster programs represent the ultimate in online search packages for end-users at Exxon. Instead, we say simply that the SearchMaster programs perform a valuable service today and offer a foundation for designing and evaluating improved systems tomorrow.

TABLE I

Online Averages for End-Users in 1985

0.43	Connect Hours per Search
58	Online Prints per Search
$40	Cost per Search

REFERENCES AND NOTES

1. Landsberg, N. K.; Lawrence, B.; Lorenz, P. A.; Meadow, C. T.; Hewett, T. T., "A Joint Industrial-Academic Experiment: An Evaluation of the IIDA System," *Proceedings of the 43rd ASIS Annual Meeting*, 1980, 17, 406-408.
2. Walton, K. R.; Dedert, P. L. "Experiences at Exxon in Training End-users to Search Technical Databases Online." *ONLINE*, 1983, 7, 42-50.

ACKNOWLEDGMENT

A special thank you to Grace Love who collected and tabulated the statistical data.

FIGURE 1

BROWSE Program—The sequence of menu screens depicting a typical BROWSE search. User inputs are *in italics*. The F4 key mentioned in the text is equivalent to &CONT (i.e., continue program execution). Extraneous ORBIT-generated status messages are not shown.

(a) The user has logged on and initiates the program by entering &RUN BROWSE. The introductory message appears.
(b) The Keyword entry screen.
(c) The time option screen. The user chooses option 1 to search the most recent time period.
(d) The Keyword search executes on File CAS82.
(e, f,g) The print option screen. the user first prints 10 of the 51 references to check for relevance and then decides not to print anymore.
(h) Logoff option. The user does not continue the search in an earlier time period (1977-81) and logs off.

(a)BROWSE PROGRAM: INTRODUCTORY MESSAGE

USER:

&RUN BROWSE
&RUN INTRBROW

*****BROWSE: SUBJECT SEARCHING ON CHEMICAL ABSTRACT.*****

THIS SEARCH OPTION PERMITS THE USER TO RETRIEVE REFERENCES BY KEYWORDS.

THIS OPTION REQUIRES TWO CONCEPTS TO DESCRIBE THE SUBJECT OF INTEREST.

UP TO FOUR KEYWORDS—TWO WORDS APIECE FOR THE TWO CONCEPTS—MAY BE USED.

******PLEASE NOTE THAT THIS IS NOT INTENDED AS A TOOL FOR COMPREHENSIVE RETRIEVAL ON A SUBJECT; THAT IN REALITY IT IS A MECHANISM TO DO SOME BROWSING.**

PRESS THE F4 KEY TO PROCEED WITH THE SEARCH

(b)KEYWORD ENTRY

KEYWD ONE : *METHANE*
KEYWD ALTONE : *CH4*
KEYWD TWO : *RAMAN*
KEYWD ALTTWO : *?NO WORD*

ENTER KEYWORDS WHICH BEST DESCRIBE THE SUBJECT AREA FOR WHICH REFERENCES ARE DESIRED.

KEYWD ONE AND KEYWD ALTONE (I.E., ALTERNATE ONE) ARE USED TO ENTER TWO WORDS DESCRIBING THE **SAME CONCEPT**

KEYWD TWO AND KEYWD ALTTWO (I.E., ALTERNATE TWO) ARE USED TO ENTER TWO WORDS WHICH DESCRIBE A **DIFFERENT CONCEPT.**

THE TWO CONCEPTS TOGETHER DESCRIBE THE SUBJECT TO BE BROWSED. YOU MUST ENTER AT LEAST ONE KEYWORD FOR EACH CONCEPT.

IF ONLY ONE KEYWORD IS NECESSARY TO DESCRIBE EACH CONCEPT, ENTER THE WORDS RESPECTIVELY AS KEYWD ONE AND KEYWD TWO, AND ENTER "NO WORD" AS THE ALTERNATES.

(c)TIME OPTIONS

1) YR1982+
2) YR1977-81
3) YR1972-76
4) YR1967-71

THE KEYWORD SEARCH MAY BE CONDUCTED USING ONE OF FOUR TIME PERIOD OPTIONS.

THE FIRST OPTION WILL SEARCH THE SUBJECT FROM 1982 FORWARD ***AND* THEN WILL OFFER OPTIONS TO SEARCH ALL THE WAY BACK TO 1967 IN FIVE YEAR INTERVALS.**

THE OTHER OPTIONS WILL SEARCH THE SUBJECT ONLY IN THE INDICATED TIME PERIODS.

ENTER 1 TO SEARCH FROM 1982 FORWARD; ENTER 2 TO SEARCH THE 1977-81 TIME PERIOD ONLY; ENTER 3 TO SEARCH THE 1972-76 TIME PERIOD ONLY; ENTER 4 TO SEARCH THE 1967-71 TIME PERIOD ONLY.

Enter numbers, ALL or NONE: ?1

(d)SEAR I EXECUTION ON FILE CAS82

KEYBOARD SEARCH COVERING 1982 FORWARD BEGINS.

&RUN KEYWD
(METHANE OR CH4) LINK (RAMAN OR NO WORD)

PROG:
NO PSTG (NO WORD)
SS 1 PSTG (51)

SS 2/C?
USER:

NOTE THE NUMBER OF REFERENCES FOLLOWING "SS 1 PSTG." THESE REFERENCES CONTAIN THE SPECIFIED KEYWORDS.

PRESS F4 TO PROCEED

(e)PRINT OPTION

1) PRINT ALL
2) PRINT TEN

THE NUMBER IN PARENTHESES FOLLOWING "SS 1 PSTG" IS THE NUMBER OF REFERENCES RESULTING FROM THE KEYWORD SEARCH.

ENTER 1 TO PRINT THEM ALL UP TO A MAXIMUM OF 100

ENTER 2 TO PRINT THE FIRST 10

ENTER NONE TO EXIT THE PRINT MODE

IF THERE ARE LESS THAN 10 REFERENCES, ENTER 1.

IF THERE ARE MANY REFERENCES (>25), PRINT 10 ONLY TO CHECK THEM FOR RELEVANCE. YOU WILL THEN BE PROMPTED TO PRINT THEM ALL IF YOU WISH.

Enter numbers, ALL or NONE: *?2*

(f)TEN REFERENCES ARE PRINTED

&PRINTER ON

PRINT 10

PROG:

-1 –
AN – CA03-61773(B)
TI – Extended measurement and assignment of isotropic Raman transitions in the .nu.1 region of methane-d4 (12CD4)
AU – Loick, Jens Erik; Dwyoung, Adelbert; Esherick, Peter
OS – Aarhus Univ., Dep. Chem., Aarhus, Den., DK-8000
SO – J. Raman Spectrosc. (JRSPAF), V 16 (3), p. 163-70, 1985, ISSN 03770486

&PRINTER OFF

(g)SECOND PRINT OPTION

1) PRINT ALL ?
2) PRINT END

ENTER 1 IF YOU PRINTED TEN REFERENCES TO CHECK FOR RELEVANCE AND YOU NOW WANT TO PRINT THEM ALL UP TO A MAXIMUM OF 100.

ENTER 2 TO EXIT THE PRINT MODE

Enter numbers, ALL or NONE: *?2*

(h)LOGOFF OPTION

1) CONTINUE
2) LOGOFF

THE KEYWORD SEARCH MAY BE CONTINUED INTO AN EARLIER TIME PERIOD.

ENTER 1 TO CONTINUE THE SEARCH

ENTER 2 TO STOP SEARCHING AND LOG OFF THE SYSTEM

Enter numbers, ALL or NONE: *?2*

FIGURE 2

1985 CONNECT HOURS

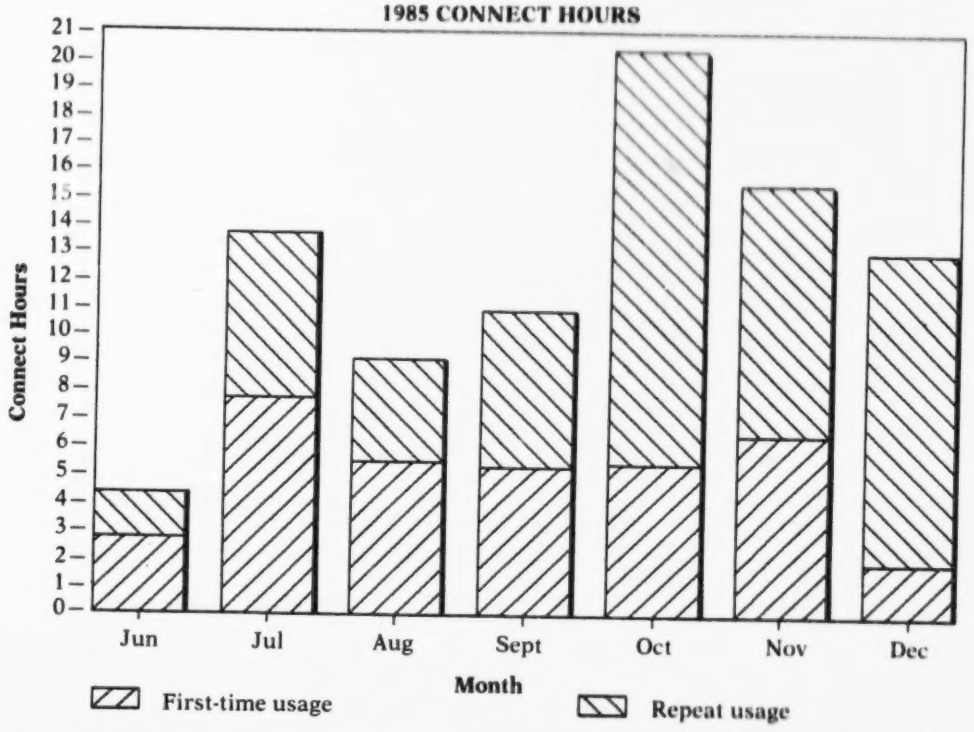


FIGURE 3
NUMBER OF USERS IN 1985

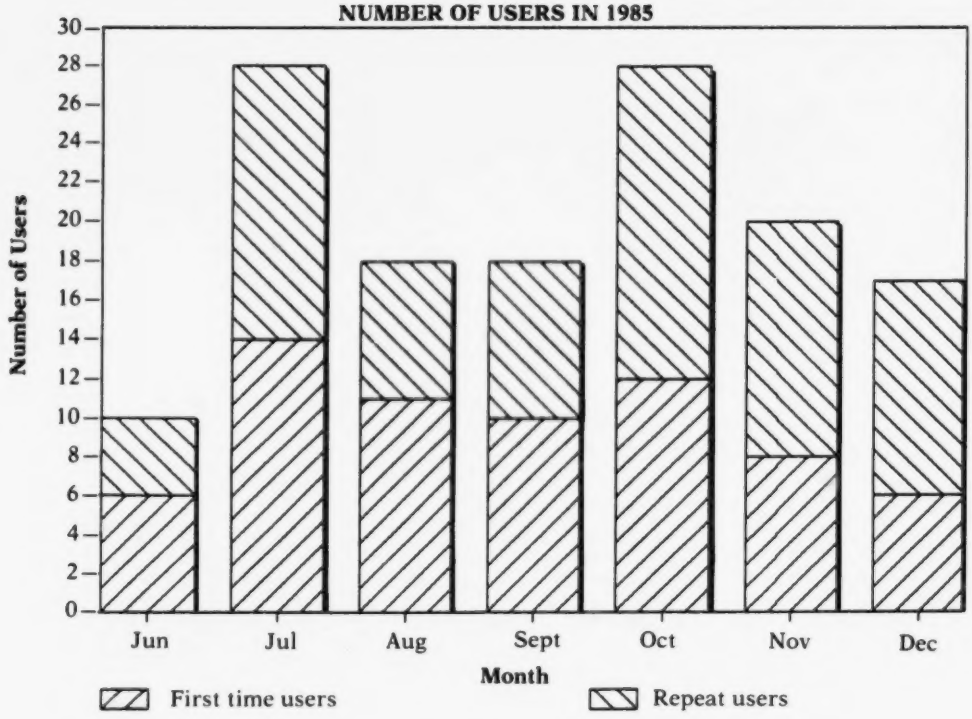


FIGURE 4
USER DISTRIBUTION BY NUMBER OF SESSIONS

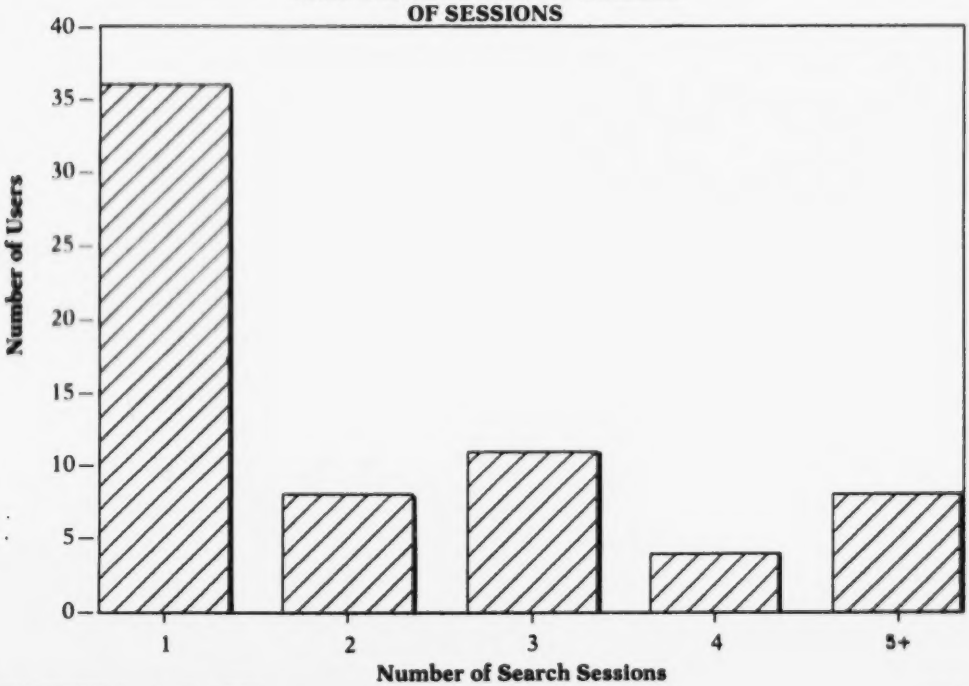


FIGURE 5

END-USER SEARCHING ACTIVITY

USAGE BY SEARCH TYPE

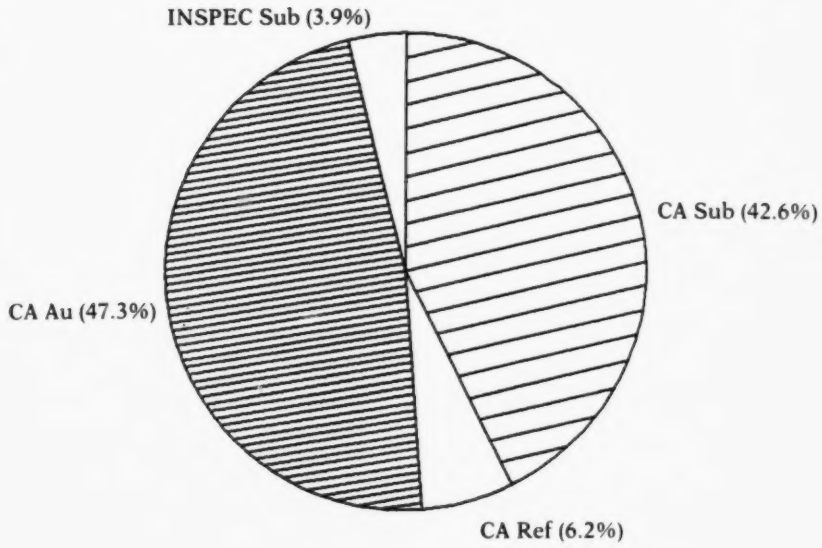
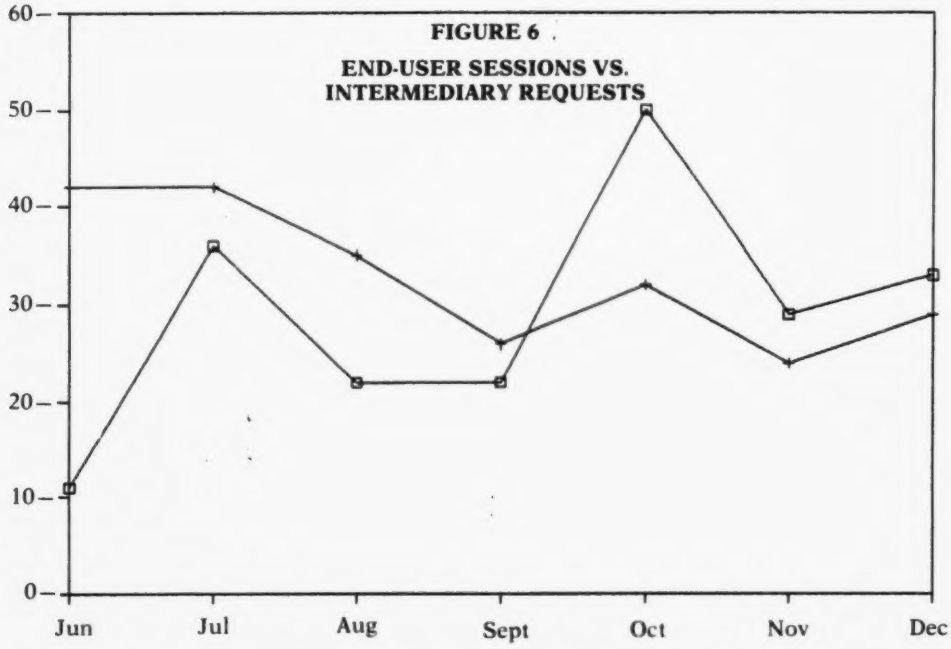


FIGURE 6

END-USER SESSIONS VS. INTERMEDIARY REQUESTS



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ELIMINATING FEES FOR ONLINE SEARCH SERVICES IN A UNIVERSITY LIBRARY

by Virgil Diodato
Reference Librarian
Governors State University Library

INTRODUCTION

What happens to a university library's online searching service when a new policy eliminates the fees paid by its clients? Such a policy change can affect the number of searches requested, the nature of the search results, and how the library staff view the cost of information services. At Governors State University Library, we have gone from charging all patrons for online searches, to offering the services free of charge to the University community. Less than one year after instituting the new policy, we know that it has strongly affected the library.

Governors State University is not a typical institution of higher education. Opened in 1971, it serves only third and fourth year undergraduate students as well as graduate students. The 5,000 students are almost all part time, evening students, and their average age is about 35 years. Major University divisions include four Colleges (Arts and Sciences; Business and Public Administration; Education; and Health Professions) and the Board of Governors program, which awards credit for life experiences. The University Library contains about 240,000 volumes and 2,500 current serial subscriptions. There are 8.5 librarians and about thirty library support staff members. Online searching services, available since 1976, use DIALOG (almost exclusively) and BRS. The most heavily used databases are **ERIC**, **MEDLINE**, and **PsycINFO**, which are searched via IBM PC XT and IBM M300 microcomputers. The four searchers devote only a fraction of their time to online services. They include two reference librarians (who together handle about sixty-five percent of the search requests), the teaching materials center technical assistant (twenty-five percent), and the documents librarian (ten percent). There is some subject specialization, with one searcher performing the overwhelming majority of the ERIC searches and another handling most of the MEDLINE requests. Patrons usually are present during their online searches.

THE EXPERIMENT

In September of 1985, our new library director of one month recommended that we not charge the University community for online services. There were various reasons for him to introduce what we have called subsidized searching or *The Experiment*. The Experiment was a reaction to no longer being able to afford paper services like *Chemical Abstracts*. The Experiment was to be a market analysis, a way to learn something about our patrons' potential needs for online services. Probably more than anything else, The Experiment was a way to make online searching just another information service. As has been the case for our reference desk and telephone services, online services would be free of direct payments from most clients.

There was little preparation for our move to subsidized searching. There were several staff meetings during September of 1985, when we learned that the size of the subsidy would be $5,000—about the amount spent for online searching in each of the previous two academic years, 1983-84 and 1984-85. In September we also set up guidelines for subsidized searching. It was to be available only for University students, faculty, and staff, and only if the search request was related to University work. Other clients still would pay a five dollar surcharge in addition to the costs of connect time, royalties, offline printing, and telecommunications. In late September we announced our subsidized searching policy by sending a memo to students, faculty, and staff.

We spent the first $1,000 by October 9. One-fifth of a previous year's worth of searching was done in less than two weeks! The $5,000 was spent entirely by early November. More money became available, and we have continued to do subsidized searching as of this writing (May, 1986). We have no plans to return to charging our patrons.

CHANGES ENCOUNTERED DURING SUBSIDIZED SEARCHING

Although there was little time to plan for subsidized searching, we did have some expectations and concerns about what would happen. Our expectations were positive. We felt we would be inundated with search requests, which would give us an opportunity to demonstrate that the University (including the library) should increase its support of online ser-

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vices. All of our concerns were questions. What if one unit of the University or even a single faculty member dominated searching services? What if the University administration offset subsidized searching this year by taking money away from the library budget next year? What if search requests increase so much that we take money away from other lines of the library budget to pay for our searching? We also should have asked how the change in our charging structure would affect the way we searched.

Indeed, we have been inundated with search requests, but no one person or unit has dominated the requests. We feel our service now demonstrates its usefulness and that it does so without harming other library services and functions. Much of the rest of this article describes this writer's interpretation of the changes that have taken place since the introduction of subsidized searching. To document some of these changes, I will compare 1985-6 searching statistics with those of the two previous academic years. Table 1 summarizes much of this information. In the statistics, a "search" is the service a searcher provides to

TABLE 1

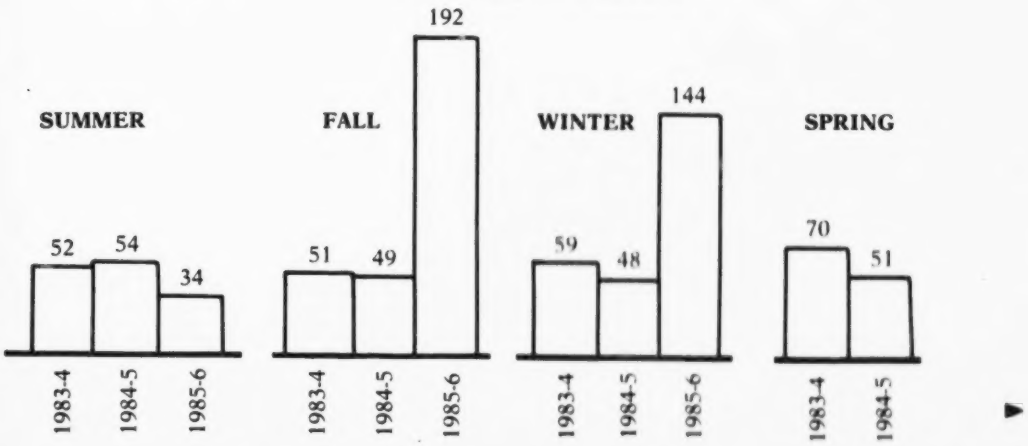
SEARCH SERVICE STATISTICS, GOVERNORS STATE UNIVERSITY LIBRARY, 1983-1986.

	Number of Searches	Mean Databases per Search	Mean Dollars per Search	Mean Minutes per Search	Mean Online Records per Search	Mean Offline Records per Search
Sum 83-4	52	1.48	21.61	22.29	7.96	54.48
Fall 83-4	51	1.22	17.75	19.94	13.12	46.90
Wtr 83-4	59	1.30	17.54	18.01	12.22	25.82
Spr 83-4	70	1.47	22.17	17.75	11.30	59.27
1983-1984	232	1.38	19.85	19.35	11.21	46.77
Sum 84-5	54	1.59	16.85	15.29	5.78	48.14
Fall 84-5	49	1.31	14.12	18.12	13.88	30.76
Wtr 84-5	48	1.62	18.38	20.63	9.28	45.02
Spr 84-5	51	1.67	27.13	18.40	22.13	50.92
1984-1985	202	1.55	19.15	18.02	12.64	43.65
Sum 85-6	34	1.88	20.96	20.48	16.42	44.68
*Fall 85-6	192	2.54	32.06	20.42	20.59	51.89
*Wtr 85-6	144	2.10	23.88	16.69	27.08	28.24
*Fall-Wtr 85-6	336	2.35	28.57	18.85	23.39	41.68

* Subsidized searching took place in Fall and Winter, 1985-1986.

FIGURE 1

NUMBER OF SEARCHES, GOVERNORS STATE UNIVERSITY LIBRARY, BY QUARTERS, 1983-1986.



respond to one person's need. A search can involve many databases, if that is what it takes to answer a question. It can take many days, if a patron and searcher agree that the first attempt at searching needs to be amended or revised.

More searches and longer response times.

During the first term of subsidized searching, fall 1985-6, we performed 192 searches. This was about four times as many searches as in either of the two previous fall terms. (See Figure 1.) Each searcher probably spent more time offering this service than he or she did previously. We realized within a few weeks that trying to do too much searching not only degraded our search performance but also interfered with our responsibilities. We also have come to accept the fact that increased requests cause longer response times than we ever have had. During our peak month, November 1985, it became typical for a patron to wait two to three weeks between handing in a request and having the search performed. The important thing is that we have become comfortable with this, especially since few patrons withdraw requests when told of the long wait. We learned that speed is not nearly as important to patrons as the opportunity to get information not readily available in our paper tools. Waiting for search results, often while pursuing other aspects of research, can be a more efficient use of a patron's time than taking on a very involved and perhaps fruitless manual search. Still, we explain to patrons that something of a gamble exists here. The requestor could wait a couple of weeks for online results that might not be pertinent. Our patrons so value their time that they often accept this gamble. However, a patron might not mind waiting for results (usually lists of citations), but he or she can become very concerned if the journals and books cited are not easily obtained.

During winter of 1985-6, our second term of subsidized searching, the demand has subsided. Although the 144 searches more than double the number of searches done in each of the previous two winters, they are noticeably less than the 192 searches done in fall, 1985-6. It is possible that winter curriculum brings different information needs than fall curriculum, and that could have affected our clients' requests. Instead, we think that the winter demand rate is simply a better reflection of our patrons' needs for online services. The sudden elimination of online fees in the fall was such a unique situation that fall statistics do not tell us much about typical search demands. Therefore, we see demand in the next two or three years being about two or two and a half times as great – rather than four times as great – as demand in the previous two years.

Increased importance of graduate student clientele.

After switching to subsidized searching, requests have increased from all categories of the University community: undergraduate students, graduate students, and faculty/staff. The greatest increase arises from graduate students. Previously we had about as many undergraduate as graduate clients. After introducing subsidized searching, graduates have outnumbered undergraduates by about four to one. This might be related to increased requests from our business students, though we do not yet have the data to support this claim.

. . .we are almost certain that students from our College of Business and Public Administration have increased their use of our online services more dramatically than students from any other of our colleges. Perhaps graduate students in business are much more likely than undergraduate business students to have assignments served well by online searching. . .

Nevertheless, we are almost certain that students from our College of Business and Public Administration have increased their use of our online services more dramatically than students from any other of our colleges. Perhaps graduate students in business are much more likely than undergraduate business students to have assignments served well by online searching, while other subject areas do not have such a differentiation between undergraduate and graduate assignments. Subsidized searching has had little effect on the proportion of graduate student requests from our College of Education. Searches for graduate education students consistently have far outnumbered those for undergraduate education students, regardless of our pricing structure. Subsidized online services have attracted only a handful of undergraduate education requests in the past year. Both before and since subsidized searching, search requests from the whole student body continue to outnumber faculty/staff requests by about fifty percent.

Increased requests from our campus com-

munity have caused a percentage decrease in services requested by patrons outside the University. It looks as if this academic year we will receive as many requests—thirty to forty—from visitors, as we call them, as we had in previous years. That is not surprising, since we still charge visitors for searching services. Our visitors seem to fall into two categories: small business people who work nearby; and, other libraries' patrons who are not satisfied with or do not have access to online services in their own public or academic libraries. Also, online services to visitors have not increased because it is likely their organizations, be they businesses or libraries, are providing more acceptable in-house online services. The ubiquitousness of microcomputers, the decreasing costs of modems, and the variety of online services for the consumer, make it a reasonable hypothesis that visitors' needs for our services should not be greater than a year or two ago.

More multidatabase searching.

The average number of databases used per search has increased from about one and a half databases during the last two years of charging fees to two and a third files after we changed our charging structure. No longer worrying about charging the patron too much, we are taking opportunities to try another database if the first one does not respond satisfactorily to a patron's needs. Removing patron fees has put us at ease with trying to be very comprehensive for those patrons, such as thesis writers, who want to retrieve a lot of information. For example, searching both MEDLINE and PsycINFO rather than only MEDLINE has become quite common for our communication disorders clients.

More online displaying of results.

After almost a year of subsidized searching, we have about doubled the number of citations displayed or downloaded during a search, without changing our rate of offline print requests. We have averaged about twenty-three online citations per search during subsidized searching, compared to about twelve in the previous two years. Part of this probably is due to our increasing use of downloading techniques. But another factor might well be that we are becoming very at ease with online evaluation of citations as well as with immediate delivery of results to clients.

So, there are two ways in which our new policy has affected how we use online citations. First, less concern about spending the patron's money has allowed us freedom to take larger online samples for evaluating search results. In the past, we probably saved money by doing brief online inspections. In such cases, the patron took on the burden of weeding out the irrelevant citations in the offline printout received a few days after the online search. Now, we and our patrons have the opportunity to increase our use of online evaluation to reduce the irrelevancy of offline results. We can look at ten online citations as easily as we once might have looked at only three. Second, online displaying and downloading have increased because we have delivered immediate results to more and more of our patrons. If someone needs information right away, we can deliver it, perhaps by downloading fifty or more citations, without trying to balance the value of a patron's time against a monetary charge to the patron. What we do seem to be balancing are values of different kinds of time. We might urge patrons who have no concerns about timeliness to wait for offline printouts so that we can spend more of the University's online funds for those people who must have results delivered immediately. We might urge patrons with casual information needs to wait for offline results because the downloading and in-house printing procedure takes staff time that could be better applied to more critical needs. And we might reimburse patrons who have waited unusually long for search appointments by handing them immediate results, regardless of whether or not they request immediate delivery.

More nonbibliographic searching.

Over the past couple of years searchers have seen access increase to nonbibliographic databases, including statistical and directory databases. Although our use of such databases ought to have increased regardless of any changes in charging policy, we find that subsidized searching has allowed more use of databases like **PTS TIME SERIES** and **AMERICAN MEN AND WOMEN OF SCIENCE**. A search through five or six such databases to find data on a company, product, or person not adequately covered in our paper reference tools can cost about fifty dollars, more than many students would have wanted to pay before subsidized searching.

By the way, nonbibliographic services for us truly have been online services. With little or no exception, searches of statistical or directory databases have involved no requests to the online service for offline printouts. Our patrons who ask for such data often need the information immediately. Although we do download the data and then print it after logging off, it is not unusual for a patron to jot down notes as data appear on the screen.

More experimentation by searchers.

This is difficult to document, but our use ►

now of databases infrequently used before subsidized searching means to us that we must be doing a great deal of experimenting and/or learning online. For example, by trying several databases during a rather difficult search, we learn which databases are most appropriate for which topics. By allowing time for experimentation, we acquire new skills, even if it takes us several tries to perform our first online sort. And it is pleasing to discover that we can transfer skills from familiar databases to new ones. The use of new databases and the application of new techniques to familiar databases not only helps the patron being served at the moment but also increases our experience and skill and thus serves many future patrons.

More dollars per search.

For all the above reasons, we are spending more dollars for each search we do. Prior to fall 1985, the average search cost between nineteen and twenty dollars. This covers items billed to us by online services: connect time, royalties, telecommunications, and offline printing fees. During subsidized searching, the average cost has risen to about twenty-eight and a half dollars, almost a fifty percent increase. We do not have the data to do a cost/benefit analysis, but we feel that the benefit to patrons has increased enough to warrant the increased dollars. With money considerations not more or less important in online services than in any other of our information services, we feel we are using reasonable resources to respond to people's needs. We are as willing occasionally to spend a hundred dollars on an online search as we are occasionally to have our reference desk librarian spend half an hour away from the desk helping a patron with a complex information need.

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Little change in search connect time.

Regardless of our charging structure over the past three years, our average search has required eighteen to nineteen minutes of connect time. Providing subsidized searches has not increased our online time. This is a little surprising, especially since we now use more databases per search and display more citations online than when we charged for our service. Although factors such as characteristics of new searchers, changing needs of patrons, and technological improvements in equipment can affect the length of searches, we feel that two other factors provide the best explanations for keeping our search time steady. First, we have become better searchers. Doing four times more searches in November 1985 than we did in any previous November should have helped us learn more about online searching. At least we feel more confident about our skills than we did before. Consider that previously a typically busy month like November involved about fifty searches spread among four searchers—about twelve searches per month per searcher. But now, a busy month of 150 to 200 searches means up to thirty-five to fifty searches per searcher per month. That gives us quite an opportunity to hone searching skills.

Second, we do more quick searches than before. In 1983-4 and 1984-5, only about four percent of our searches lasted less than four minutes online. During subsidized searching in 1985-6, about eight percent of the searches have taken less than four minutes. Some of these quick searches are part of our online ready reference service, which by its nature usually must involve quick searches. This is discussed below. Other quick searches are for patrons who have requested searches that turn out to be brief. Among the clientele taking advantage of subsidized search services—a clientele that seems to have increased in variety of needs as well as in size—are patrons for whom fast searches are very appropriate. Typical is the patron requesting an online search to complete the citation to a psychology article; she lost all the information in the citation save for a few words from the title. Both she and we knew that the online PsycINFO would be much more useful than the paper *Psychological Abstracts*. We also can help a faculty member do a simple search for recent articles citing a particular scientist by using **SCISEARCH**, a tool that is not available in paper form to our patrons. We learn that quick does not have to mean dirty.

Introduction of online ready reference.

Subsidizing our searches has made us become more at ease with ready reference searching—online searching that is done on the librarian's initiative to answer a question brought or phoned in to the reference desk. Before 1985-6 we have no records that online ready reference ever was done. But now we are doing about one ready reference search per week. Currently, because our searching equip-

ment is not yet at the reference desk, the on-duty reference librarian can ask a colleague to cover the desk while the on-duty librarian goes to our search room. A typical case for online ready reference involved the patron who could recall only one word, "pseudostoicism," from an article about exceptional children. It took less than five minutes to retrieve the citation online. We average about six minutes of connect time for online ready reference queries. This certainly compares favorably with the effort for librarian and client to use paper tools to attack difficult queries. Once our online searching equipment is at the reference desk, our online ready reference services should increase.

The effect on interlibrary loan services.

Our interlibrary loan (ILL) personnel say there is no doubt that our increase in online searches has caused more ILL requests. Whether this ILL increase has been offset by a decrease in loan demand from some other sector of our clientele awaits analysis. However, we do know that the use of ILL services by online patrons has forced us to add a step to the search service process. Upon completion of a search we remind the patron to attach a copy of the search printout to any ILL request form that might be filed. The copy ought to provide the ILL staff with verification of the requested citation. We also have tried to be sure that an online patron's results clearly identify the database from which we retrieved each citation. This is especially important when we edit search results on a microcomputer and, say, gather citations from several databases into one list. Identifying the database seems to help ILL services from which we borrow, since "database search" can be an insufficient source of information.

Awareness of the document delivery weak link.

Our increasing volume of online searches and the subsequent loan requests that some of them generate have helped us realize that document delivery can be a weak link in the information service process and that a database may be only as good as the access to documents it identifies. There are at least two ways for us to strengthen that link. First, we might consider making available to our patrons document delivery services provided by online services and producers. Whether the library or patron should support the cost of ordering articles online is an unanswered question, but there are certainly patrons who would be willing to pay some money to obtain within a week, copies of clearly relevant articles from journals not in our collection. Another unanswered question is whether online document delivery services could provide the documents more quickly than our own ILL. (The questions are unanswered because we have only begun to ask them.) Second, we plan to provide our MEDLINE patrons, if they wish, with citations only to documents held by our library. In the DIALOG system, we are saving journal name searches for periodicals held by our library. We have arranged these 225 journals into seven categories like nursing, communication disorders, and psychology. Once we save all these searches, we will be able to combine a subject search strategy with one of our saved journal-name searches, and thus list only citations we know are available in our collection.

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Thinking of the book budget as an information services budget.

The elimination of patron charges for online searches has made us think more critically than ever before about our library budget. After all, our budget is not limitless, and increased use of subsidized online services has to affect our budget. We are concerned about where the money for online services comes from. We also are concerned that whereas online funds buy information requested by patrons, book funds often buy information with only the expectation that patrons will ask for that information. While it is easy to predict that some books, like a particular dictionary of science, and some periodicals, like news magazines, will get a lot of use, we find it is very difficult to make useful predictions about many of our books and journals. Purchasing based on such predicting seems so different from obtaining information for the online patron, who sits next to the searcher, saying yes or no to whether information on the screen is likely to solve the patron's immediate information need. We would like to provide information – in any form – that responds to clients' demands and that anticipates their needs. Thus, we would like our purchasing of paper mate-

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rials to become less speculative than it has been. The role of online services in our library has helped us think about our acquisitions philosophy.

Record keeping is streamlined.

Online services have made us think about record keeping, too. When we did only fifty searches per quarter, it was acceptable to log a lot of information about each search: patron name, searcher name, database searched, the time in and time out of each database, databank fees, our patron charges, the number of citations displayed online and printed offline, and information about the status of the patron. Once our searches increased to over one hundred per quarter, it simply has not been possible to spend so much time with these records. So, now, we no longer record time in and out of each database. Patron charges no longer exist for most clients. And we do not ask our searchers to record how many displays and printouts they have requested. We have all the data we need to reconcile our databank invoices. We still could collect information periodically about, for example, connect time, should we feel a need to evaluate how long our searches take. But we would rather not collect data only because we might use it some day.

Developing a policy for subsidized services.

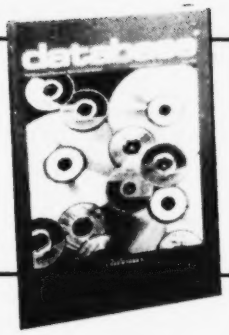
Although we had a searching policy statement before introducing subsidized searching, our pricing change forced us to think about the policy. For example, should we charge alumni? This question made us realize that database searching is a service that supports the goals and objectives of the library; it is meant primarily to support the university's curriculum and research. Alumni are outside that community, and our policy now nicely fits them into the group of non-university people who pay for searches. Are there university students who ought not request an online service? Once searching became free to our students, we have encountered very few students who request searches for work that their instructors meant them to do manually. It certainly supports the curriculum for us to require an instructor's signature on some students' search request forms should an instructor ask us to set up such a procedure. Our policy now provides for this. Thus, some needle-in-the-haystack and some very complex manual research is assigned by instructors to help students practice research skills. As of this writing, however, we have had no instructor require a signature for a search request.

Our online policy retains a feature it always has had. The searcher makes the decision whether or not to do an online search for a patron regardless of whether or not the patron requests the search. A searcher might try to negotiate for (and offer assistance with) doing a manual search if the paper tools are readily available to the patron. How strongly the searcher negotiates and under what conditions a searcher will elect not to negotiate at all, depends on the searcher. Indeed it is likely that some requests from some patrons will result in online searches if the requests are presented to one searcher but will result in manual searches if presented to another searcher. This is not unusual. Different reference librarians in different situations can react differently to identical requests, regardless of whether they are employing online or paper tools.

SUMMARY

We and our clients have profited from our elimination of online search fees. That is the simple result of having changed our policy. Measuring the benefit is complex, for all the effects described above are so interrelated among themselves and so related to other factors not even mentioned in this article. For example, it is possible that our search requests would have increased this academic year regardless of our charging policy. Still, we are convinced that the benefit exists. We have at least doubled the number of patrons served by online searching at costs that are quite reasonable: longer waiting times to receive online results, and transferring about five percent of the library materials budget to online services. We have learned that many of our online patrons want more, good information later than less information now. We have learned to serve not only more patrons but also new needs. Thus, graduate students, especially those in business, have emerged as a very important segment of our clientele. The increase in numbers and types of requests and less concern about spending patrons' funds', has, in turn, permitted us to do more experimenting online and to do more multidatabase searching and to do more online displaying of results. Yes, the average search today costs us more than the average search cost our clients before we instituted subsidized searching. That is to be expected when trying to save the patron's direct costs is no longer a major factor in search strategy. We are pleased to pay for the opportunity to increase our searching experience and skills, to expand our services to graduate and business students, and to introduce online ready reference.

Communications to the author should be addressed to Virgil Diodato, Reference Librarian, Governors State University Library, University Park, IL 60466.



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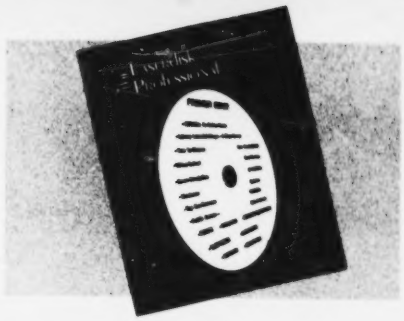

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